

AD-A171 045

MOORED TEMPERATURE AND CONDUCTIVITY OBSERVATIONS DURING  
AIMEX (ARCTIC INT. (U) OREGON STATE UNIV CORVALLIS COLL  
OF OCEANOGRAPHY M D LEVINE ET AL. JUN 86 DATA-123

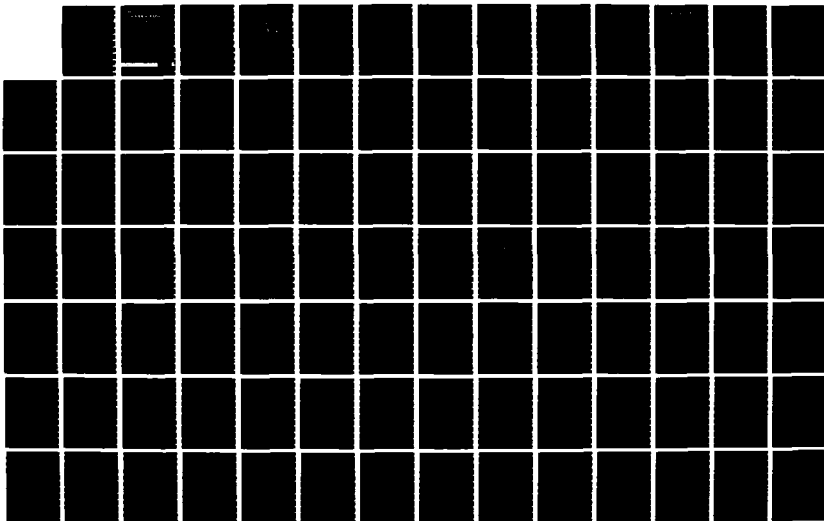
1/3

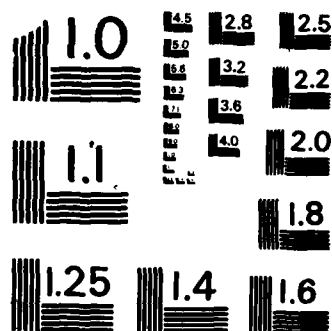
UNCLASSIFIED

N00014-84-C-0218

F/G 8/10

NL



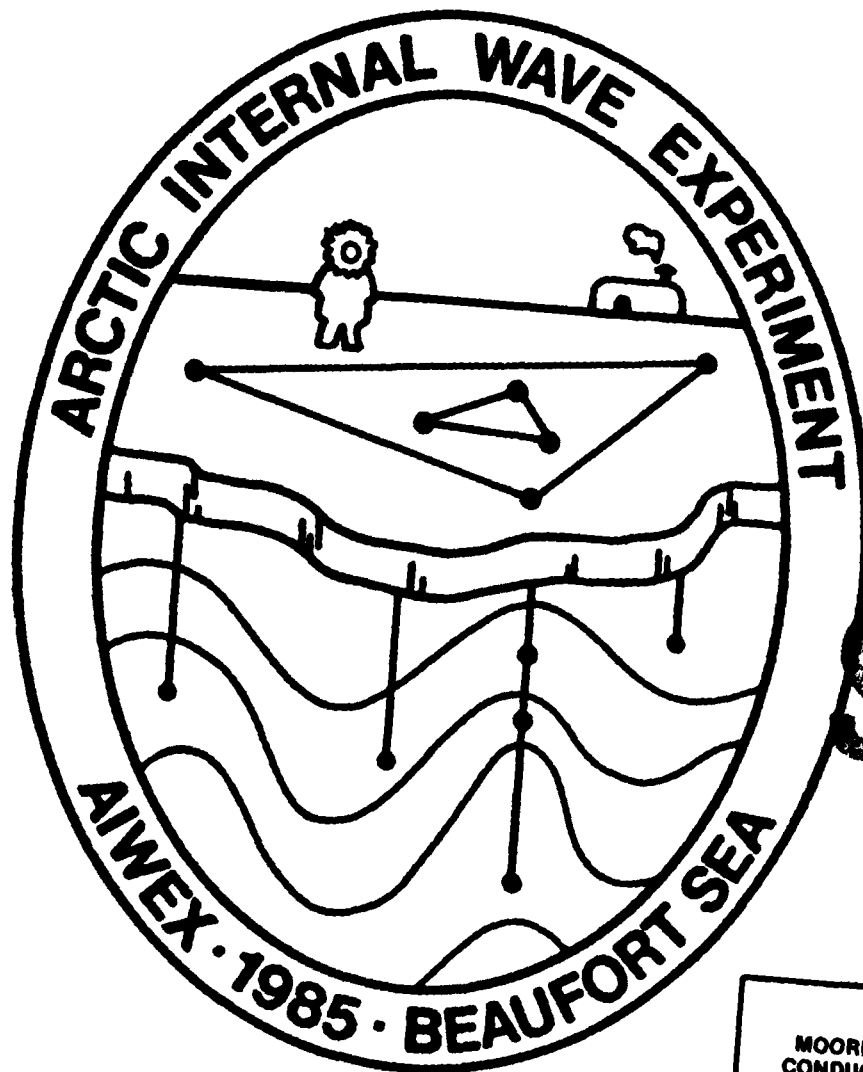


MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

College of

# OCEANOGRAPHY

AD-A171 045



DTIC FILE COPY

This document has been approved  
for public release and sale; its  
distribution is unlimited.

OREGON STATE UNIVERSITY

## MOORED TEMPERATURE AND CONDUCTIVITY OBSERVATIONS DURING AIWEX

by  
Murray D. Levine  
Steve R. Gard  
Jay Simpkins

Office of Naval Research  
N00014-84-C-0218  
NR-083-102  
College of Oceanography  
Oregon State University

Reference 86-9  
June 1986  
Data Report 123

Reproduction in whole or part is permitted for any  
purpose of the United States Government

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

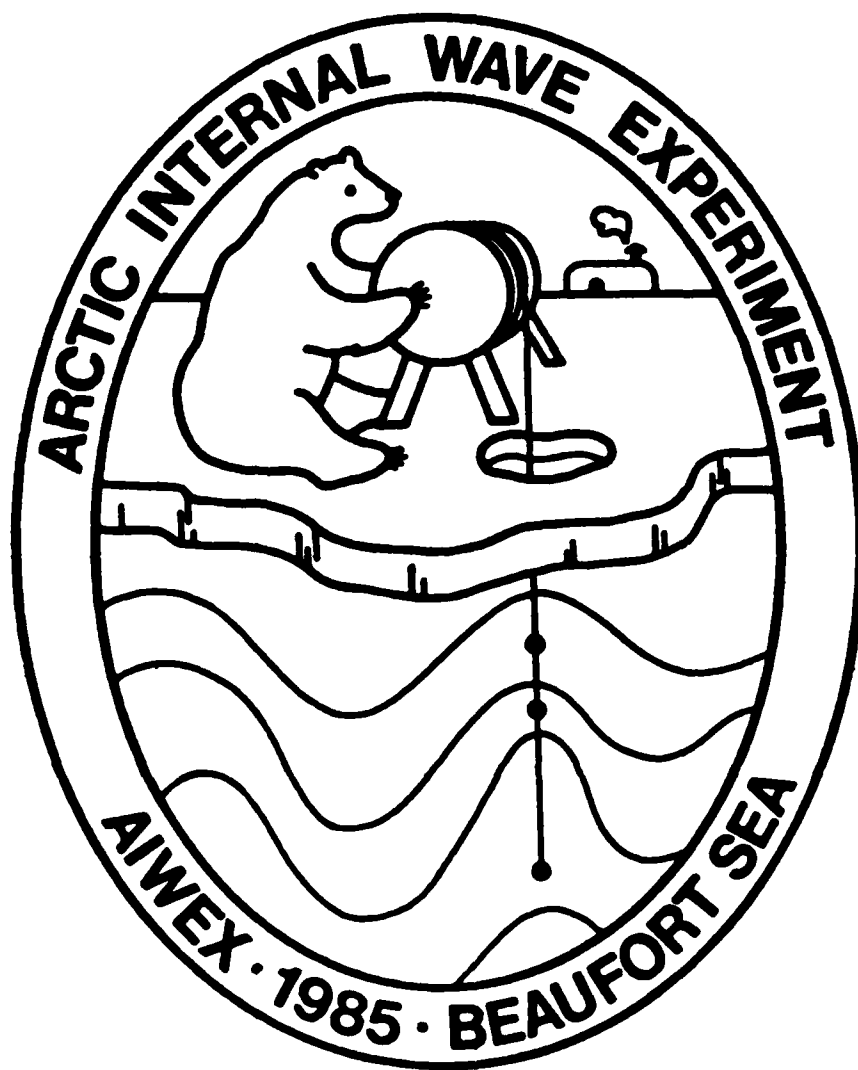
REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 86-9	2. GOVT ACCESSION NO. AD A121045	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  MOORED TEMPERATURE AND CONDUCTIVITY OBSERVATIONS DURING AIWEX		5. TYPE OF REPORT & PERIOD COVERED  Data Report
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) MURRAY D. LEVINE STEVE GARD JAY SIMPKINS		8. CONTRACT OR GRANT NUMBER(s) N0001-84-C-0218
9. PERFORMING ORGANIZATION NAME AND ADDRESS College of Oceanography Oregon State University Corvallis, OR 97331		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR083-102
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Ocean Science & Technology Division Arlington, Virginia 22217		12. REPORT DATE June 1986
		13. NUMBER OF PAGES 195
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Arctic Internal Wave Experiment (AIWEX) Temperature and Conductivity Internal Waves		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Time series are presented from 13 temperature and 5 conductivity sensors (Sea-Bird Electronics) suspended below the ice during March-April 1985 near 74°N, 144°W as part of the Arctic Internal Wave Experiment (AIWEX). The sensors were located between 80 and 508 m depth; horizontal separations ranged from 150 to 1000 m. Selected spectra and coherences are also included.		

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE  
S/N 0102-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)





MOORED TEMPERATURE AND  
CONDUCTIVITY OBSERVATIONS  
DURING AIWEX

Murray D. Levine  
Steve R. Gard  
Jay Simpkins

College of Oceanography  
Oregon State University  
Corvallis, OR 97331



Accession For	
NUM 02241	<input checked="" type="checkbox"/>
DATE	
TIME	
LOC	
Dist	
Date	
Time	
Loc	
Dist	
A-1	

## Table of Contents

ACKNOWLEDGEMENTS.....	i
INTRODUCTION.....	1
INSTRUMENTATION.....	2
ANALYSIS.....	10
OBSERVATIONS.....	14
TABLE OF DAILY MEAN, STANDARD DEVIATIONS AND SKEWNESS.....	15
TIME SERIES OF TEMPERATURE, CONDUCTIVITY, AND PRESSURE Fifteen-minute averages.....	29
TIME SERIES OF TEMPERATURE AND SALINITY Fifteen-minute averages.....	32
TIME SERIES OF TEMPERATURE, CONDUCTIVITY, AND PRESSURE One-minute averages.....	35
TIME SERIES OF TEMPERATURE AND SALINITY One-minute averages.....	115
SPECTRA OF TEMPERATURE AND SALINITY.....	155
VERTICAL COHERENCES.....	175
HORIZONTAL COHERENCES.....	185

## ACKNOWLEDGEMENTS

We thank James Morison for providing enthusiasm and guidance in the initial planning of AIWEX and for being an "Arctic hero" role model throughout the experiment. Special thanks are extended to Clayton Paulson and Rick Baumann without whose expertise and muscle this project would not have succeeded. The excellent organization and administration of the logistical support by Andy Heiberg, Allen Hielscher and Imants Virsnieks, made the AIWEX camp a comfortable place to be, even though "it's no picnic out there". We appreciate the endless toil of Matt Valley in running the mess hall and providing entertaining stories and philosophy. The efforts of Ed Siefert in making preparations and Dennis Bartow for calibration of the instruments are much appreciated. The cover illustration and AIWEX logo were kindly provided by Barbara Levine.

The support for this research by the Office of Naval Research through contract N00014-84-C-0218 code 420 PO (this project) and code 425 AR (logistical support) is gratefully acknowledged.

## INTRODUCTION

This report presents observations from moorings of temperature, conductivity and pressure, made during the Arctic Internal Wave Experiment (AIWEX) in March-April 1985. The main objectives of AIWEX were:

- To make comprehensive measurements of internal waves and micro-structure in the Arctic Ocean, and
- To identify important processes that affect the Arctic internal wave field.

To meet these objectives, observations at a variety of horizontal, vertical and temporal scales made by investigators from many institutions will need to be analyzed.

The purpose of the temperature and conductivity measurements was to provide time series from which inferences could be made about the vertical displacement of the internal waves. Specific goals of this project include:

- To verify the suspected low spectral level of the internal wave field in the Arctic Ocean,
- To estimate in detail the coherence structure of the high-frequency internal wave field from horizontal and vertical arrays of sensors, and
- To compare variations of the internal wave field with variations in the surface stress, eddy field and dissipation.

## INSTRUMENTATION

A total of 13 temperature (SBE-3), 5 conductivity (SBE-4) and 2 pressure (Digiquartz) sensors were deployed on 7 moorings (Figs. 1 and 2). The locations and technical details of the sensors are given in Table 1. Each mooring consisted of an individual 3-conductor, shielded electrical cable (Belden #8771) for each sensor attached to a strength member of 1/4" Samson Dura-Plex Braid (Composite Polyester/Polyolefin). The moorings were secured at the surface of the ice and kept taut by a steel weight at the bottom.

A schematic of the data acquisition system is shown in Fig. 3. The output of each sensor is a frequency that was fed into a 20-channel SBE 11/20 (Sea-Bird Electronics) Deck Unit. The Deck Unit digitized the frequency signal using a highly accurate hybrid period counting technique. A PDP 11/23 computer acquired the data through an RS-232 line and averaged values over 1 minute intervals. The data were then written on 8" flexible disks and displayed on a terminal and printer. For limited periods data were also recorded at a 1 s sampling rate.

There was significant data loss during the first week of operation, apparently due to a bad electrical contact on a board in the SBE 11/20 Deck Unit. After cleaning the contacts, the problem did not reoccur. Small gaps in data throughout the experiment were due to power interruptions (both scheduled and unexpected). Noise spiking was present on some channels due to a timing error in the Deck Unit; we believe this did not significantly degrade the observations in the internal wave frequency band.

### Calibration

All the temperature and conductivity sensors were calibrated in November 1984 at the Northwest Regional Calibration Center (NRCC). The conductivity calibrations are referenced to the Practical Salinity Scale (1978) which defines the conductivity at 35 ppt, 15°C, 0 pressure to be 4.2914 Siemens/meter. The factory calibrations of the new pressure

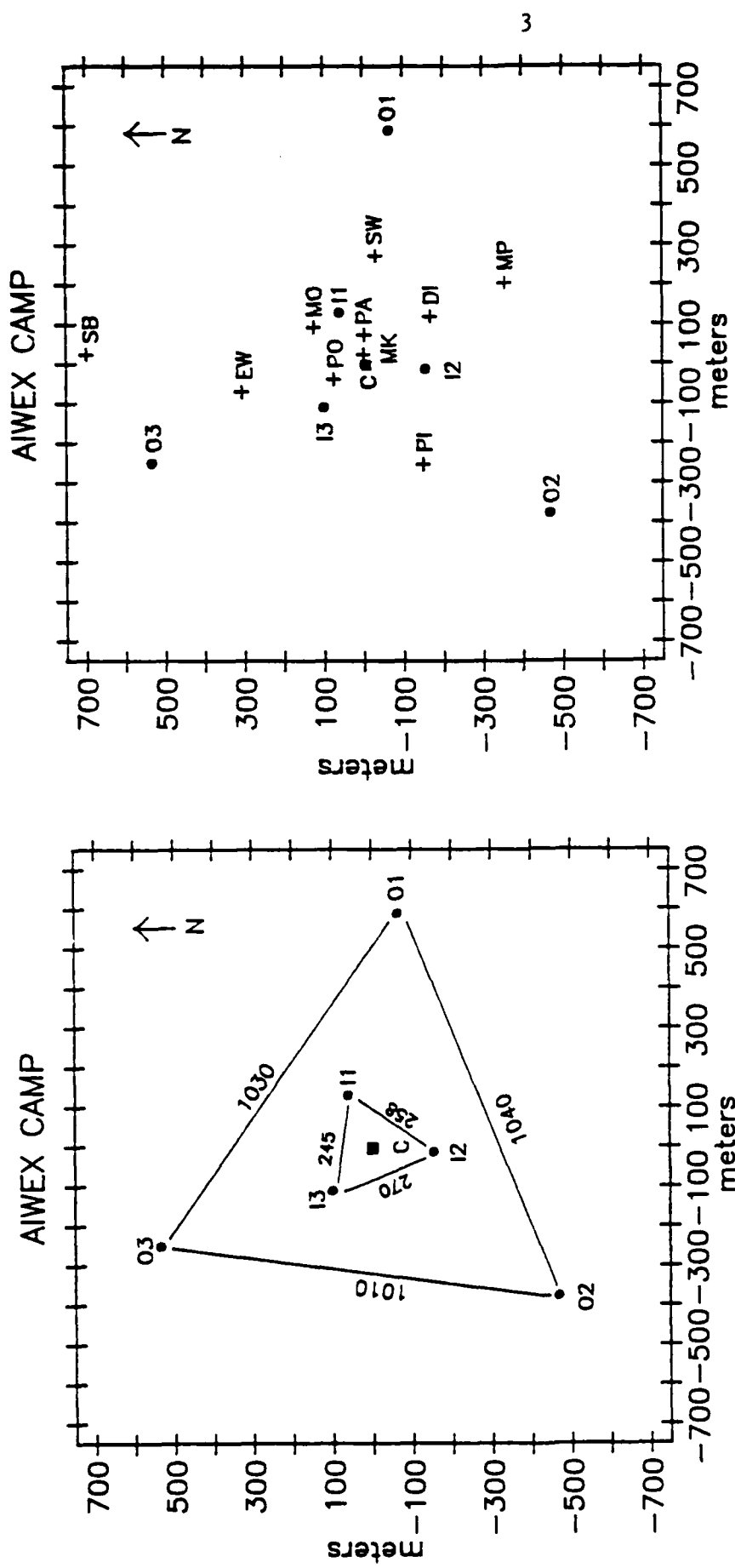


Fig. 1. Plan view of AIWEX ice camp

- a). Location of the 7 temperature-conductivity moorings:
- 1 central (C),
  - 3 inner (11, 12, 13),
  - 3 outer (01, 02, 03).

- b). Location of moorings in relation to measurements made by other investigators. The labels are abbreviations of the names of the PI's.

MO - Morison  
PI - Pinkel  
DI - Dillon  
PA - Paulson  
MP - Morison/Pinkel

EW - Ewart  
PO - Podney  
SW - Swift  
MK - McPhee/Kolle

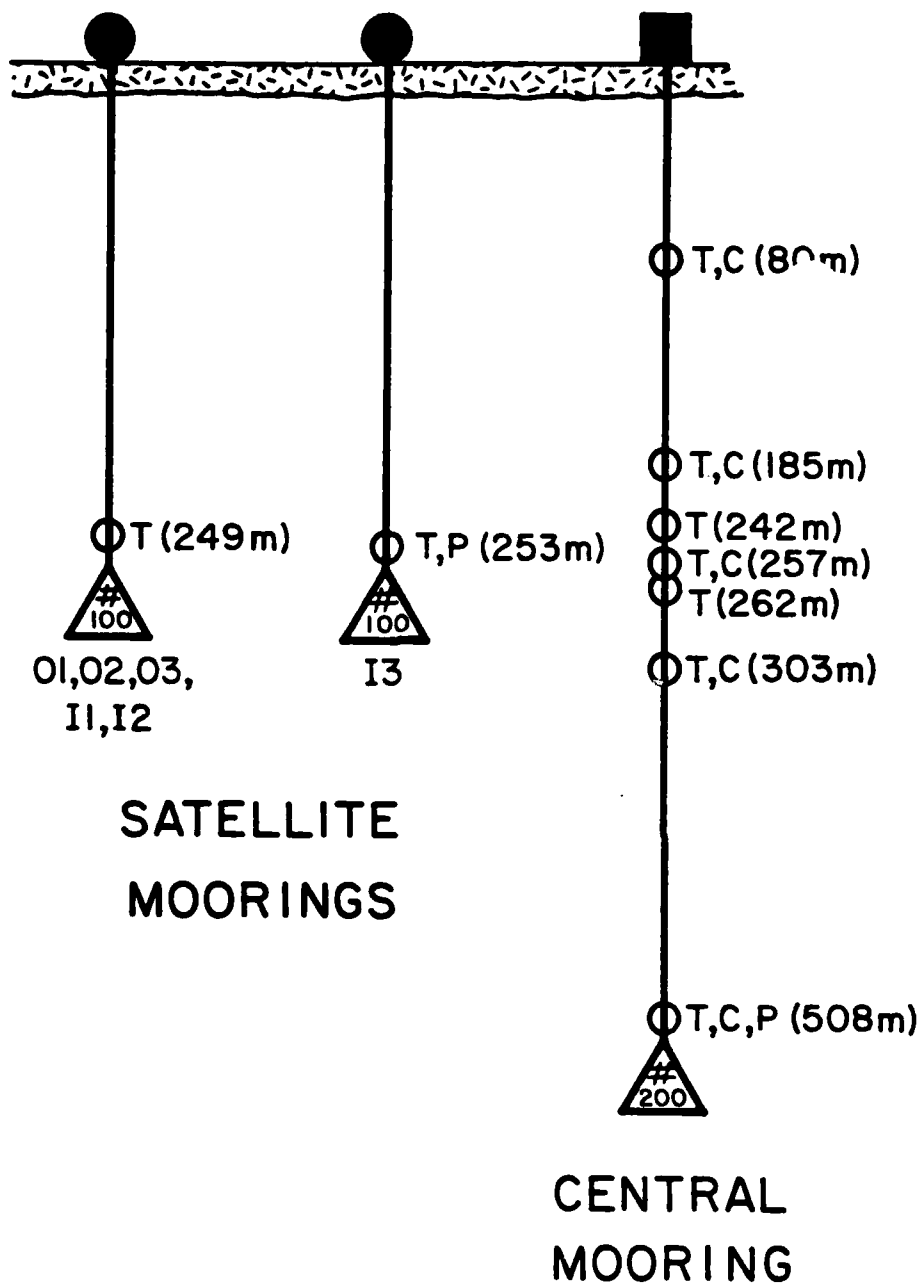


Fig. 2. Schematic of temperature-conductivity moorings indicating the depths of temperature (T), conductivity (C), and pressure (P) sensors.



Table 1. Information about the 20 sensors deployed during AIWEX, including location and calibration data.

Mooring	Depth m	Type of Measure- ment	Manu- facturer †	Serial Number	Calibration Differences*		
					Absolute (Units: $\times 10^{-3}^{\circ}\text{C}$ or $\times 10^{-4}\text{S/m}$ )		Sensitivity** (% change)
					Mean	S.Dev.	
C	80	T	SBE	612	9.1	1.6	1.4
C	80	C	SBE	208	5.7	8.8	1.0
C	185	T	SBE	609	11.0	1.7	1.0
C	185	C	SBE	209	-2.3	15.7	1.7
C	242	T	SBE	611	9.0	1.5	1.0
C	257	T	SBE	613	13.0	1.3	0.9
C	257	C	SBE	211	7.2	6.1	1.0
C	262	T	SBE	614	11.1	1.7	0.3
C	303	T	SBE	616	12.4	1.2	0.8
C	303	C	SBE	212	10.9	7.3	0.9
C	508	T	SBE	615	10.7	1.5	0.6
C	508	C	SBE	210	4.4	7.5	1.0
C	508	P	PARO	21432			
I1	249	T	SBE	428	2.1	1.8	0.5
I2	249	T	SBE	416	-5.1	1.8	1.3
I3	253	T	SBE	610	13.7	1.2	0.6
I3	253	P	PARO	21449			
O1	249	T	SBE	424			
O2	249	T	SBE	436	3.6	2.1	0.2
O3	249	T	SBE	435	-4.1	2.2	0.6

\* Based on the difference between pre-AIWEX calibrations and post-AIWEX intercomparisons.

\*\* Sensitivity is defined to be the change in temperature or conductivity per change in sensor frequency.

† SBE - Sea-Bird Electronics  
PARO - Paroscientific, Inc.

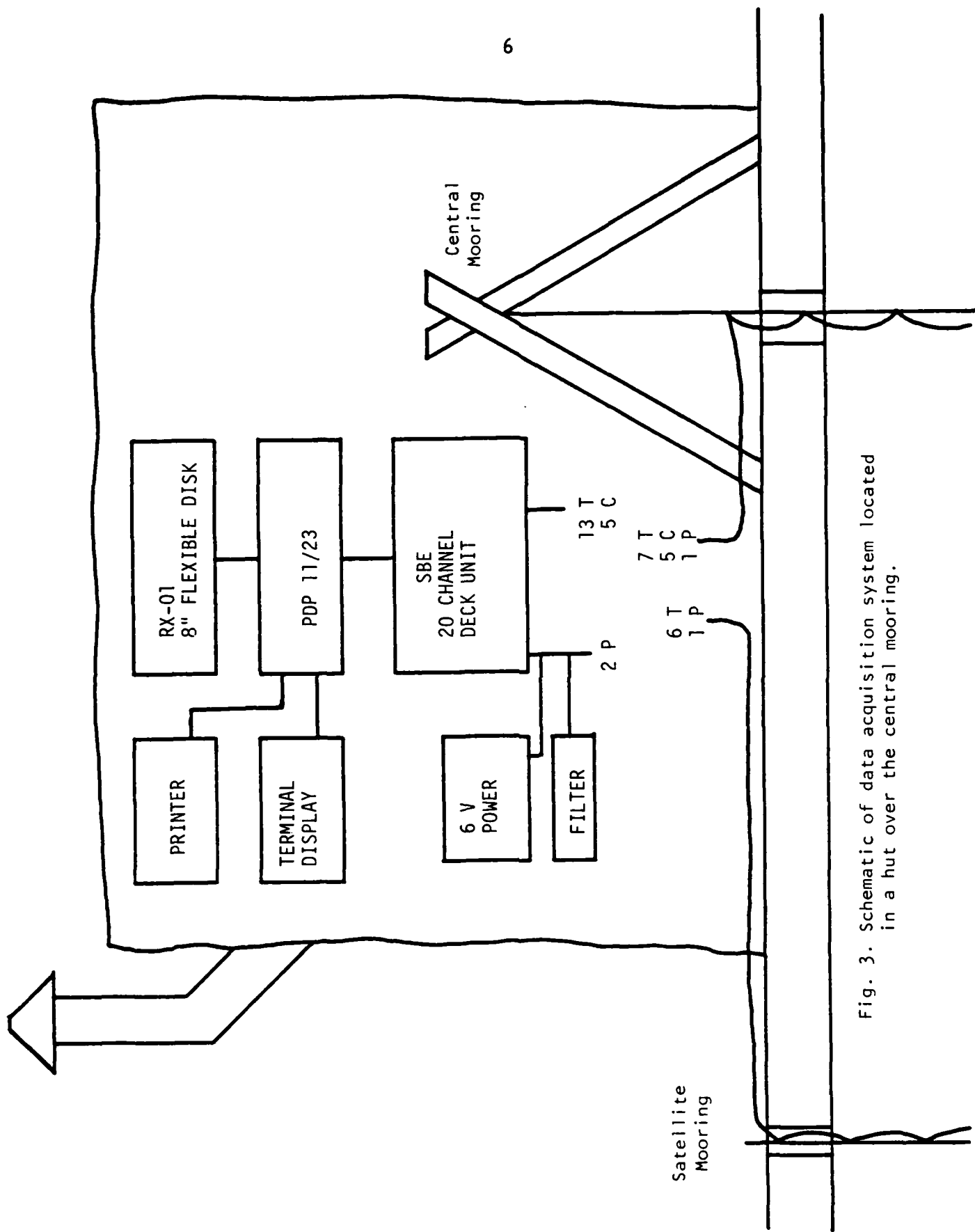


Fig. 3. Schematic of data acquisition system located in a hut over the central mooring.

sensors were used as supplied by the manufacturer (Paroscientific, Inc.). Pressures were converted to depth assuming a constant water density of  $1028.13 \text{ kg/m}^3$  in order to be consistent with the measurements made with the Arctic Profiling System (APS) by James Morison (University of Washington, Seattle).

After AIWEX the behavior of the temperature and conductivity sensors were compared by placing all the sensors in the OSU calibration tank. While this comparison was not directly traceable to an absolute standard, the sensors could be compared with two SBE-3 sensors (#544 and #607) that are used routinely in the OSU calibration lab as secondary standards. The differences between the pre-AIWEX calibrations and post-AIWEX intercomparison are given in Table 1 for each sensor.

The difference in sensitivity between pre- and post-AIWEX calibrations was small for all sensors -- less than 2%. Sensitivity is defined to be the change in temperature or conductivity per change in sensor frequency; the values in Table 1 were estimated by measuring the change in the sensor frequency over the range in temperature from  $-0.0392$  to  $0.0396^\circ\text{C}$  or over the range in conductivity from  $2.7360$  to  $2.8766 \text{ S/m}$ .

The difference in the absolute calibration varied with the sensor but was no larger than  $0.015^\circ\text{C}$  or  $0.0011 \text{ S/m}$ . For each sensor the difference between the NRCC calibrations and the post-AIWEX intercomparison were calculated. The mean and standard deviation of these calibration differences based on 6 calibration points are given in Table 1. The new temperature sensors with serial numbers 6xx were very consistent with each other and measured  $0.009$  to  $0.013^\circ\text{C}$  higher in post-calibration. The earlier model temperature sensors with serial numbers 4xx differed by  $-0.005$  to  $+0.004^\circ\text{C}$ ; sensor #424 failed upon recovery and could not be recalibrated. The apparent systematic calibration differences between old and new sensors has not yet been explained.

Even though temperature sensor #615 moored at 508 m performed consistently in both pre- and post-AIWEX calibration, a very significant offset in calibration was observed when the sensor was in situ. All attempts to reproduce this behavior in the laboratory have failed. It does appear, however, that the relative temperature fluctuations measured by the sensor are reasonable. Comparisons with the temperature at 508 m measured by the APS throughout AIWEX indicate that the temperature offset was  $+0.11^{\circ}\text{C}$ . Therefore, this constant offset has been removed in all the data from #615.

#### Deployment and Recovery

The moorings were deployed in and around the AIWEX ice camp located about 350 km north of Prudhoe Bay, Alaska. The position of the camp as a function of time determined from satellite navigation is shown in Fig. 4.

Deployment of the central mooring began on 19 March GMT from inside a hut. A 200 lb. weight was first lowered through a 16-inch diameter hole in the 2.5 m thick ice. The wire and sensors were then attached to the strength member with plastic cable ties. The satellite moorings were installed through an 8 inch diameter hole by first unspooling on the ice the entire length of the preassembled strength member, wire, and sensors. The top end of the mooring was attached to a snowmobile, and a 100 lb. weight and the rest of the mooring was lowered by driving the snowmobile toward the hole. An oil drum lying on its side near the hole provided a smooth surface over which the mooring could slide.

Recovery of the satellite moorings began on 26 April; the central mooring was recovered on 29 April. Since the satellite moorings were left to freeze into the ice, recovery was made through a new hole that was drilled within a few feet of the mooring line. A hook on the end of an L-shaped pole was used to snag the line, and the mooring was pulled up with the aid of the snowmobile. The hole for the central mooring was kept free of ice by adding heat from the oil-burning hut heater with a heat exchanger. A small electric winch was used to retrieve this mooring.

# AIWEX CAMP POSITION

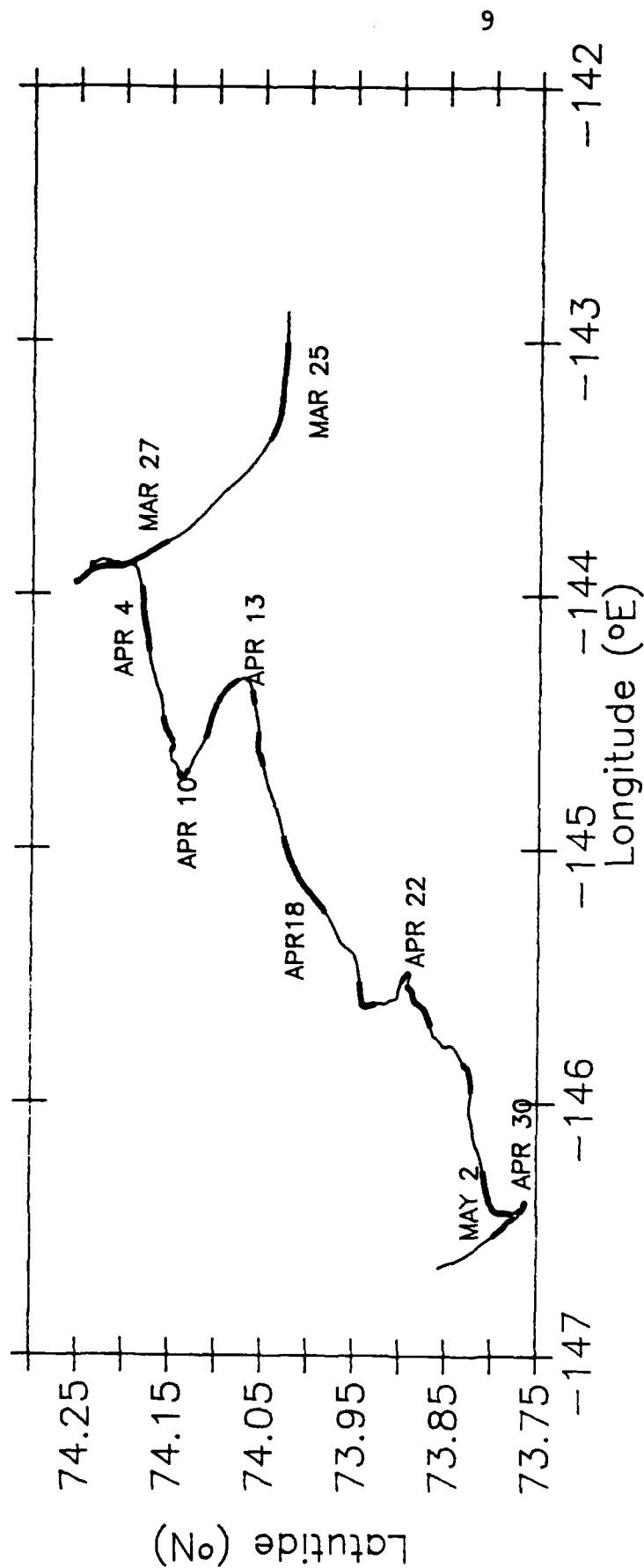


Fig. 4. Position of AIWEX ice camp as a function of time determined from satellite navigation. The line width changes at midnight each day.

## ANALYSIS

Calculating Salinity

Time series of salinity can be calculated from measurements of temperature and conductivity. Unfortunately the response times of the sensors are not the same; the temperature sensor has a 200 ms time constant while the response of the conductivity sensor is controlled by the flushing rate of the water through a tube 0.2 m long and ranging from 4 to 7 mm in diameter. A simple model was developed to try to predict the temperature inside the conductivity cell,  $T_I(t)$ , that could then be used with the conductivity measurement to calculate salinity. Assume in time  $\Delta t$  the heat that leaves the cell is given by  $C b |w(t)| T_I(t) \Delta t$  where  $C$  is the heat capacity/volume,  $b$  is the cross-sectional area of the cell, and  $|w(t)|$  is the speed of the water flushing through the cell. During this same time the heat entering the cell is  $C b |w(t)| T_O(t) \Delta t$  where  $T_O$  is the temperature outside the cell measured by a nearby temperature probe. Hence the change of total heat inside the cell is equal to the heat entering minus the heat leaving:

$$\ell [T_I(t+\Delta t) - T_I(t)] = b |w(t)| [T_O(t) - T_I(t)] \Delta t$$

where  $\ell$  is the length of the cell. Assuming that the water in the cell is well-mixed and  $w(t) = \text{constant}$ ,

$$\frac{dT_I(t)}{dt} + \frac{1}{r} T_I(t) = \frac{1}{r} T_O(t) \quad (1)$$

where  $r = bw/\ell$  is a flushing time. The frequency response of  $T_I$  to a fluctuating outside temperature of the form  $T_O = \exp[i\omega t]$  can be expressed by

$$\left| \frac{T_I(t)}{T_O(t)} \right|^2 = \frac{1}{(1+\omega^2 r^2)} \quad (2)$$

with  $T_I$  lagging  $T_O$  by a phase

$$\theta = \text{Atan } \omega \tau \quad (3)$$

Equation (1) is easily applied to  $T_o(t)$  (measured) using finite-difference methods to calculate the temperature inside the cell,  $T_I(t)$ , once  $\tau$  is determined.

To determine  $\tau$ , the T and C measurements from 257 m are used. It is anticipated from historical data that salinity is linearly related to temperature over a small range around 257 m, and can be expressed by

$$S = \lambda_1 T + \lambda_o + \epsilon \quad (4)$$

where  $\epsilon$  is the error in S due to violation of this assumption. The empirical equation relating T and C to S is nearly linear over the small range of T and C that is observed from the sensor at 257 m and can be written

$$S = \alpha T + \beta C \quad (5)$$

where  $\alpha = -1.11 \text{ ppt}/^\circ\text{C}$  and  $\beta = 13.51 \text{ ppt}/(\text{S m}^{-1})$ . Therefore a linear relationship between T and C can be written from (4) and (5):

$$C = \frac{(\lambda_1 - \alpha)}{\beta} T + \frac{\lambda_o}{\beta} + \frac{\epsilon}{\beta} \quad (6)$$

We therefore assume that  $C(t)$  is linearly related to the temperature measured inside the cell,  $T_I(t)$ , and that the observed phase between  $C(t)$  and  $T_o(t)$  is representative of the phase between  $T_I(t)$  and  $T_o(t)$  (Fig. 5).

In order to interpret the phase in the context of (3) the coherence must be 1, that is  $\epsilon$  must be small. At high frequency the coherence is lower indicating that  $\epsilon$  may be significant, and the interpretation of the phase is more complicated. At low frequency the phase can be reasonably reproduced by (3) with  $\tau = 4$  minutes (Fig. 5). To confirm this, the  $T_o$

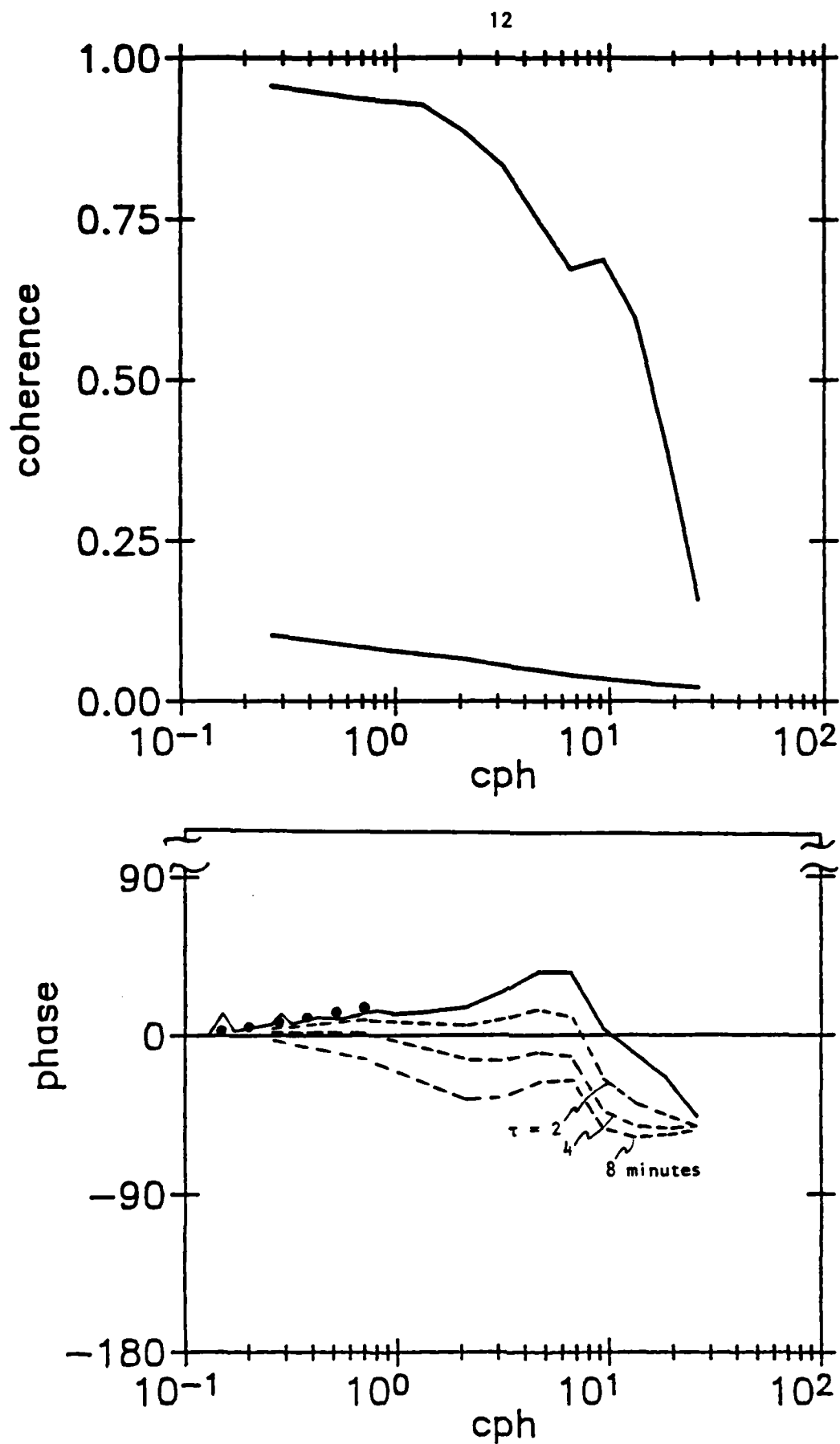


Fig. 5. Coherence and phase between conductivity and temperature measured at 257 m on the central mooring (solid line). Phase between conductivity and filtered temperature using  $\tau = 2, 4$ , and 8 minutes is plotted with a dashed line. Phase modeled by equation (3) with  $\tau = 4$  minutes is shown by a dotted line.



time series was filtered using (1) for a range of values of  $\tau$ , and the phase between C and the filtered  $T_0$  estimated (Fig. 5). As expected, the value of  $\tau = 4$  minutes reduces the phase difference at low frequency. The phase difference at high frequency may be due to a breakdown in the linear T-S assumption (4) and/or in the simple filtering model (1). We believe the latter effect is dominant, primarily due to the variability of  $\tau$ . Therefore, calculated salinity is less reliable at higher frequency.

At the depths of the other four pairs of T-C sensors, a constant, linear T-S relationship clearly does not exist, and this method cannot be used to estimate  $\tau$ . Hence the same value of  $\tau = 4$  minutes was used to estimate  $T_I$  at all depths.

There is some interest in knowing how well S can be inferred from T. One method of determining this relationship is by linear regression analysis. The data were first averaged over 15 minutes to minimize any error in estimating  $\tau$ . The best-fit values of  $\lambda_0$  and  $\lambda_1$  from (4), the percent of the S variance that can be explained from T, and the correlation coefficient between T and S are given below for each pair of T-C sensors:

Depth (m)	$\lambda_1 \pm 90\% \text{ conf. lim.}$ (ppt/°C)	$\lambda_0 \pm 90\% \text{ conf. lim.}$ (ppt)	% S variance explained	Correlation coefficient
80	$-1.1530 \pm 0.0790$	$30.424 \pm 0.104$	19.0	-0.44
185	$1.2030 \pm 0.0630$	$35.000 \pm 0.095$	28.0	0.53
257	$0.7310 \pm 0.0070$	$34.659 \pm 0.004$	93.0	0.97
303	$0.3084 \pm 0.0143$	$34.554 \pm 0.001$	34.0	0.58
508	$-0.0874 \pm 0.0202$	$34.889 \pm 0.010$	2.0	-0.14

#### Spectral Analysis and Coherences

Spectra and coherences were calculated by combining separate estimates at high and low frequencies. The high frequency spectrum was calculated from the one-minute averaged data by dividing the series into segments of 5.6 h length. The low frequency spectrum was estimated from a single time series of one-hour averages.

## OBSERVATIONS

Tables of the daily mean, standard deviation and skewness for each sensor are given on pages 15 to 27.

In order to see the entire time series at a glance, 15-minute averages are plotted for the entire experiment on pages 30 and 31. Salinity, calculated from temperature and conductivity, are plotted with temperature on page 33.

The entire data set sampled at 1 minute intervals is presented on pages 36 to 113. Plots of salinity and temperature are found on pages 116 to 154. Density was not plotted since it is usually indistinguishable from salinity.

Average spectra of temperature and salinity are plotted on pages 156 to 173. Selected coherence and phase between vertically and horizontally separated sensors are presented on pages 186 to 195.

## STATISTICS

Tables of the daily mean, standard deviation and skewness for each sensor.

	MAR 22 JD 81	MAR 23 JD 82	MAR 24 JD 83	MAR 25 JD 84	MAR 26 JD 85	MAR 27 JD 86	MAR 28 JD 87	
01(249)	----	----	-0.8449	-0.8197	-0.8685	-0.8955	-0.9189	mean
°C	----	----	0.0209	0.0286	0.0374	0.0267	0.0264	std.
	----	----	-0.0654	-0.2932	0.5399	0.0866	-0.0063	skew
02(249)	----	----	----	-0.8827	-0.8963	-0.9231	-0.9195	mean
°C	----	----	----	0.0369	0.0327	0.0244	0.0255	std.
	----	----	----	0.0030	0.0827	-0.1065	-0.1082	skew
03(249)	----	----	-0.8285	-0.8388	-0.8992	-0.9240	-0.9262	mean
°C	----	----	0.0180	0.0298	0.0336	0.0275	0.0221	std.
	----	----	0.0253	0.3917	-0.0033	-0.3043	-0.1483	skew
I1(249)	----	----	-0.8291	-0.8363	-0.8904	-0.9197	-0.9246	mean
°C	----	----	0.0093	0.0294	0.0360	0.0277	0.0238	std.
	----	----	0.4155	-0.2272	0.3206	-0.1685	0.0592	skew
I2(249)	----	----	----	-0.8586	-0.9005	-0.9286	-0.9322	mean
°C	----	----	----	0.0270	0.0346	0.0291	0.0243	std.
	----	----	----	-0.2201	0.2058	-0.0967	0.0449	skew
I3(253)	----	----	----	----	----	----	-0.8460	mean
°C	----	----	----	----	----	----	0.0229	std.
	----	----	----	----	----	----	-0.1418	skew
I3(253)	----	----	248.9	248.5	249.2	249.7	249.8	mean
m	----	----	0.0397	0.3851	0.3788	0.0449	0.0517	std.
	----	----	-1.6009	-0.4242	0.0573	1.0404	-1.3984	skew
C(242)	-1.0716	-1.0595	-1.0275	-1.0101	-1.0356	-1.0467	-1.0287	mean
°C	0.0102	0.0191	0.0345	0.0467	0.0272	0.0266	0.0222	std.
	0.6279	0.2739	0.1029	-0.1836	-0.0567	0.3372	0.0875	skew
C(262)	-0.6319	-0.6190	-0.5865	-0.5916	-0.6356	-0.6465	-0.6390	mean
°C	0.0170	0.0182	0.0273	0.0429	0.0332	0.0267	0.0287	std.
	-0.2629	-0.7939	-0.0069	-0.1244	-0.3661	0.0394	-0.1720	skew
C(508)	508.0	507.9	----	----	507.4	507.4	507.3	mean
m	----	0.1419	----	----	0.0584	0.0646	0.0623	std.
	----	-1.8810	----	----	-0.2155	-0.1164	-0.0328	skew

	MAR 22 JD 81	MAR 23 JD 82	MAR 24 JD 83	MAR 25 JD 84	MAR 26 JD 85	MAR 27 JD 86	MAR 28 JD 87	
C(80)	-1.3330	-1.3314	-1.3298	-1.3307	-1.3309	-1.3089	-1.3077	mean
°C	0.0035	0.0071	0.0063	0.0045	0.0080	0.0057	0.0060	std.
	-0.6918	-0.4078	-0.7362	-0.4173	1.1796	-0.3921	-0.3838	skew
C(80)	2.5766	2.5774	2.5712	2.5632	2.5674	2.5724	2.5730	mean
S/m	0.0009	0.0011	0.0039	0.0031	0.0042	0.0019	0.0015	std.
	0.4098	-0.4432	-0.2191	-0.0868	-0.1360	0.0259	-0.0008	skew
C(185)	-1.5265	-1.5122	-1.5113	-1.5053	-1.5242	-1.5088	-1.4969	mean
°C	0.0079	0.0055	0.0147	0.0205	0.0065	0.0138	0.0165	std.
	0.0194	-1.9704	0.6063	0.0048	-0.5215	0.7372	0.7712	skew
C(185)	2.6512	2.6520	2.6515	2.6507	2.6478	2.6493	2.6501	mean
S/m	0.0008	0.0007	0.0015	0.0030	0.0013	0.0014	0.0020	std.
	-0.0285	-0.2179	0.4925	0.0778	0.0878	0.2976	0.6675	skew
C(257)	-0.7455	-0.7670	-0.7213	-0.6940	-0.7317	-0.7418	-0.7400	mean
°C	0.0135	0.0121	0.0274	0.0398	0.0328	0.0272	0.0240	std.
	0.1535	0.4817	0.3331	-0.0883	0.0020	0.0117	-0.0817	skew
C(257)	2.7868	2.7838	2.7891	2.7926	2.7880	2.7874	2.7874	mean
S/m	0.0015	0.0017	0.0034	0.0054	0.0044	0.0024	0.0026	std.
	-0.3491	0.3708	0.3622	-0.1790	-0.0258	-0.1127	-0.5384	skew
C(303)	-0.1184	-0.1048	-0.0849	-0.0717	-0.0929	-0.1010	-0.0894	mean
°C	0.0067	0.0124	0.0213	0.0288	0.0256	0.0167	0.0168	std.
	-0.0759	0.5336	-0.7879	-0.1891	0.9214	-0.4549	-0.1339	skew
C(303)	2.8727	2.8723	2.8737	2.8751	2.8729	2.8724	2.8742	mean
S/m	0.0013	0.0012	0.0022	0.0032	0.0028	0.0016	0.0016	std.
	-0.7929	-0.0166	-0.6365	-0.1655	0.9753	-0.9066	-0.3509	skew
C(508)	0.4791	0.4817	0.4700	0.4807	0.4737	0.4711	0.4704	mean
°C	0.0042	0.0025	0.0057	0.0053	0.0063	0.0025	0.0023	std.
	0.7725	-0.6452	0.2360	-0.8392	-0.0609	0.3914	0.5482	skew
C(508)	2.9584	2.9567	2.9555	2.9563	2.9557	2.9559	2.9566	mean
S/m	0.0010	0.0004	0.0005	0.0005	0.0006	0.0007	0.0007	std.
	0.0183	2.5561	0.1850	-0.9713	-0.3973	1.4606	-0.5632	skew

	MAR 29 JD 88	MAR 30 JD 89	MAR 31 JD 90	APR 1 JD 91	APR 2 JD 92	APR 3 JD 93	APR 4 JD 94	
01(249)	-0.9157	-0.8974	-0.8873	-0.8809	-0.8876	-0.8800	-0.8942	mean
°C	0.0235	0.0187	0.0175	0.0198	0.0143	0.0157	0.0166	std.
	-0.2958	0.2894	0.0758	0.5767	0.3101	0.3847	-0.3748	skew
02(249)	-0.9164	-0.8992	-0.8908	-0.8814	-0.8820	-0.8819	-0.8849	mean
°C	0.0192	0.0199	0.0169	0.0134	0.0138	0.0136	0.0171	std.
	0.0911	0.2489	-0.3050	0.1562	0.4235	0.4263	-0.3904	skew
03(249)	-0.9143	-0.9036	-0.8986	-0.8884	-0.8895	-0.8915	-0.8898	mean
°C	0.0203	0.0161	0.0152	0.0111	0.0138	0.0127	0.0162	std.
	-0.5584	0.3261	0.2704	0.2225	0.3370	0.1753	-0.0029	skew
I1(249)	-0.9114	-0.8982	-0.8905	-0.8776	-0.8870	-0.8842	-0.8885	mean
°C	0.0259	0.0186	0.0153	0.0123	0.0136	0.0120	0.0152	std.
	-0.3238	0.2493	0.3345	0.4171	0.3500	0.2129	-0.0951	skew
I2(249)	-0.9210	-0.9075	-0.8972	-0.8859	-0.8952	-0.8903	-0.8963	mean
°C	0.0228	0.0152	0.0152	0.0113	0.0140	0.0146	0.0150	std.
	-0.2826	0.1370	0.0120	-0.6578	0.0401	0.4764	0.2555	skew
I3(253)	-0.8386	-0.8246	-0.8176	-0.8084	-0.8091	-0.8102	-0.8064	mean
°C	0.0231	0.0152	0.0155	0.0142	0.0129	0.0116	0.0199	std.
	-0.5591	-0.0209	-0.0801	0.0514	0.1761	0.2537	0.6552	skew
I3(253)	249.8	249.8	249.9	249.9	249.9	249.9	250.0	mean
m	0.0507	0.0468	0.0516	0.0362	0.0469	0.0472	0.0514	std.
	-0.1970	-0.5220	-0.1295	0.0895	0.5811	0.6944	-0.0261	skew
C(242)	-1.0264	-1.0123	-0.9966	-0.9940	-0.9937	-1.0104	-1.0108	mean
°C	0.0168	0.0143	0.0160	0.0179	0.0110	0.0142	0.0135	std.
	-0.3362	0.1137	0.1636	0.6682	-0.7238	0.1377	0.0507	skew
C(262)	-0.6393	-0.6267	-0.6216	-0.6125	-0.6058	-0.6091	-0.6105	mean
°C	0.0235	0.0204	0.0208	0.0099	0.0133	0.0114	0.0157	std.
	-0.1393	0.1530	0.3146	0.4343	0.0973	-0.1045	0.5005	skew
C(508)	507.3	507.3	507.4	507.4	507.4	507.3	507.4	mean
m	0.0555	0.0590	0.0572	0.0495	0.0620	0.0823	0.0869	std.
	0.0194	0.1383	-0.0907	0.2233	-0.1088	0.1057	-0.0975	skew

	MAR 29 JD 88	MAR 30 JD 89	MAR 31 JD 90	APR 1 JD 91	APR 2 JD 92	APR 3 JD 93	APR 4 JD 94	
C(80)	-1.3045	-1.3029	-1.2996	-1.2978	-1.2981	-1.3020	-1.3310	mean
°C	0.0044	0.0028	0.0030	0.0009	0.0025	0.0081	0.0042	std.
	-0.4473	-0.3931	-0.0851	-0.3169	0.3312	-2.7174	2.0363	skew
C(80)	2.5727	2.5724	2.5713	2.5722	2.5717	2.5706	2.5689	mean
S/m	0.0013	0.0010	0.0009	0.0004	0.0009	0.0014	0.0013	std.
	-0.2967	0.5435	-0.0457	-0.4906	-0.2046	-1.0873	0.0905	skew
C(185)	-1.4733	-1.4756	-1.4991	-1.4712	-1.4634	-1.4917	-1.5065	mean
°C	0.0113	0.0114	0.0230	0.0049	0.0029	0.0154	0.0086	std.
	-1.1552	-0.5587	0.1815	-0.5020	-1.1744	-0.0129	1.7300	skew
C(185)	2.6516	2.6524	2.6507	2.6530	2.6549	2.6513	2.6501	mean
S/m	0.0011	0.0014	0.0017	0.0005	0.0010	0.0014	0.0007	std.
	-0.4091	-0.3958	0.4563	0.2483	-0.6844	-0.1694	0.5137	skew
C(257)	-0.7431	-0.7270	-0.7200	-0.7235	-0.7012	-0.7051	-0.7121	mean
°C	0.0219	0.0190	0.0157	0.0094	0.0137	0.0145	0.0155	std.
	0.0637	-0.2185	0.1614	-0.1025	-0.2326	-0.2109	0.0131	skew
C(257)	2.7871	2.7898	2.7906	2.7896	2.7928	2.7916	2.7906	mean
S/m	0.0023	0.0019	0.0016	0.0008	0.0017	0.0018	0.0017	std.
	0.0981	0.0646	0.2550	0.0713	-0.1586	-0.3115	0.0210	skew
C(303)	-0.0948	-0.0890	-0.0709	-0.0622	-0.0455	-0.0613	-0.0884	mean
°C	0.0124	0.0109	0.0229	0.0093	0.0103	0.0181	0.0093	std.
	0.3376	1.2073	-0.2821	-0.3445	-0.7645	-0.3054	0.1729	skew
C(303)	2.8733	2.8745	2.8765	2.8770	2.8787	2.8760	2.8735	mean
S/m	0.0011	0.0010	0.0025	0.0007	0.0014	0.0018	0.0010	std.
	-0.1492	1.1022	-0.2623	-0.5925	-0.5659	-0.1366	-0.2604	skew
C(508)	0.4748	0.4803	0.4768	0.4701	0.4735	0.4729	0.4656	mean
°C	0.0048	0.0038	0.0075	0.0041	0.0069	0.0083	0.0027	std.
	0.7692	-2.1002	-0.4485	1.6730	0.7434	0.3766	-0.2075	skew
C(508)	2.9565	2.9571	2.9572	2.9561	2.9563	2.9556	2.9550	mean
S/m	0.0007	0.0006	0.0012	0.0003	0.0007	0.0008	0.0003	std.
	0.3350	0.2341	-0.2205	0.6159	0.0906	0.4654	-0.4682	skew

	APR 5 JD 95	APR 6 JD 96	APR 7 JD 97	APR 8 JD 98	APR 9 JD 99	APR 10 JD 100	APR 11 JD 101	
01(249)	-0.8727	-0.8628	-0.8619	-0.8574	-0.8513	-0.8376	-0.8511	mean
°C	0.0148	0.0143	0.0130	0.0178	0.0133	0.0111	0.0143	std.
	-0.4854	-0.2254	0.1856	-0.2091	0.5332	0.6688	0.6733	skew
02(249)	-0.8757	-0.8675	-0.8602	-0.8620	-0.8547	-0.8330	-0.8475	mean
°C	0.0154	0.0155	0.0138	0.0117	0.0136	0.0134	0.0137	std.
	0.0355	0.2444	0.0655	-0.2442	0.4154	0.4323	-0.1018	skew
03(249)	-0.8755	-0.8704	-0.8649	-0.8685	-0.8623	-0.8383	-0.8500	mean
°C	0.0145	0.0149	0.0116	0.0108	0.0109	0.0105	0.0147	std.
	-0.0945	0.1156	-0.3683	-0.2573	-0.2485	-0.3748	-0.1100	skew
11(249)	-0.8717	-0.8628	-0.8620	-0.8610	-0.8559	-0.8347	-0.8469	mean
°C	0.0145	0.0171	0.0109	0.0123	0.0146	0.0116	0.0139	std.
	-0.0857	-0.0225	-0.2650	-0.0688	0.5417	-0.1741	0.1629	skew
12(249)	-0.8795	-0.8723	-0.8685	-0.8709	-0.8627	-0.8400	-0.8554	mean
°C	0.0137	0.0177	0.0136	0.0123	0.0116	0.0131	0.0140	std.
	0.1333	0.1577	-0.0770	-0.0358	0.7039	-0.2919	0.0879	skew
13(253)	-0.7950	-0.7812	-0.7776	-0.7889	-0.7769	-0.7579	-0.7718	mean
°C	0.0135	0.0161	0.0115	0.0097	0.0141	0.0126	0.0167	std.
	0.1093	-0.0391	0.2063	0.1675	-0.3081	-0.6568	0.2267	skew
13(253)	250.0	250.1	250.1	250.1	250.1	250.1	249.9	mean
m	0.0554	0.0504	0.0368	0.0372	0.0410	0.0537	0.0698	std.
	0.1245	-0.3828	0.9230	0.0080	1.0357	-0.4715	-0.2377	skew
C(242)	-1.0024	-0.9964	-0.9898	-0.9859	-0.9735	-0.9797	-0.9753	mean
°C	0.0148	0.0106	0.0126	0.0116	0.0115	0.0108	0.0164	std.
	-0.6668	-0.1173	0.2582	0.0961	0.1577	0.1284	0.3304	skew
C(262)	-0.5930	-0.5919	-0.5779	-0.6039	-0.5732	-0.5639	-0.5746	mean
°C	0.0176	0.0152	0.0128	0.0123	0.0137	0.0158	0.0189	std.
	-0.1706	-0.4065	0.4342	0.5555	0.2200	-0.1362	-0.0858	skew
C(508)	507.5	507.6	507.6	507.6	507.6	507.6	507.3	mean
m	0.0878	0.0613	0.0595	0.0610	0.0557	0.0873	0.1329	std.
	-0.6509	0.0640	0.1040	0.1512	0.1717	-1.7320	-1.1606	skew



	APR 5 JD 95	APR 6 JD 96	APR 7 JD 97	APR 8 JD 98	APR 9 JD 99	APR 10 JD 100	APR 11 JD 101	
C(80)	-1.3059	-1.3208	-1.3346	-1.3006	-1.2989	-1.3070	-1.3288	mean
°C	0.0066	0.0117	0.0096	0.0033	0.0032	0.0151	0.0032	std.
	-1.5671	0.4889	-0.0293	-1.9827	0.3120	-0.4399	1.0880	skew
C(80)	2.5722	2.5709	2.5684	2.5710	2.5704	2.5685	2.5675	mean
S/m	0.0010	0.0018	0.0012	0.0008	0.0007	0.0018	0.0012	std.
	-0.2835	0.6421	-0.8470	-0.1906	-0.0278	-0.3873	1.2683	skew
C(185)	-1.4800	-1.4812	-1.4831	-1.4645	-1.4662	-1.4948	-1.5171	mean
°C	0.0123	0.0097	0.0135	0.0038	0.0112	0.0150	0.0055	std.
	-0.4131	0.5247	-0.4667	0.3142	-2.0428	0.0692	0.1419	skew
C(185)	2.6533	2.6530	2.6531	2.6549	2.6549	2.6525	2.6505	mean
S/m	0.0013	0.0008	0.0012	0.0010	0.0012	0.0016	0.0008	std.
	0.2095	0.2789	-0.2438	1.1512	-0.6521	0.0715	0.1599	skew
C(257)	-0.6983	-0.6865	-0.6788	-0.6931	-0.6797	-0.6575	-0.6712	mean
°C	0.0144	0.0136	0.0131	0.0131	0.0134	0.0133	0.0155	std.
	0.2423	-0.6606	0.0222	-0.1465	0.3480	-0.3064	0.1349	skew
C(257)	2.7920	2.7941	2.7955	2.7940	2.7949	2.7967	2.7960	mean
S/m	0.0016	0.0013	0.0013	0.0016	0.0013	0.0017	0.0020	std.
	-0.3049	-0.6174	0.2926	0.0939	-0.0890	-0.1697	0.0671	skew
C(303)	-0.0980	-0.0946	-0.0907	-0.0756	-0.0825	-0.0783	-0.0660	mean
°C	0.0068	0.0062	0.0073	0.0099	0.0075	0.0078	0.0139	std.
	0.1426	-0.3666	0.2300	0.3282	0.2315	0.1593	0.0255	skew
C(303)	2.8730	2.8738	2.8746	2.8754	2.8750	2.8751	2.8760	mean
S/m	0.0011	0.0008	0.0011	0.0013	0.0010	0.0007	0.0015	std.
	0.4411	0.0068	0.0843	0.3759	-0.2078	0.1809	0.0480	skew
C(508)	0.4670	0.4668	0.4650	0.4644	0.4716	0.4658	0.4764	mean
°C	0.0014	0.0018	0.0009	0.0017	0.0029	0.0024	0.0143	std.
	-0.7507	0.8163	1.2277	0.1016	-0.7062	1.5319	0.4979	skew
C(508)	2.9561	2.9567	2.9564	2.9555	2.9568	2.9552	2.9561	mean
S/m	0.0011	0.0007	0.0008	0.0006	0.0012	0.0002	0.0013	std.
	0.9821	0.2465	0.0012	0.8975	0.3285	1.0448	0.4894	skew

	APR 12 JD 102	APR 13 JD 103	APR 14 JD 104	APR 15 JD 105	APR 16 JD 106	APR 17 JD 107	APR 18 JD 108	
01(249)	-0.8129	-0.8092	-0.8070	-0.8096	-0.8010	-0.7896	-0.7787	mean
°C	0.0201	0.0165	0.0155	0.0142	0.0152	0.0163	0.0213	std.
	0.1717	-0.2528	-0.0411	-0.1490	-0.0797	-0.1704	0.3040	skew
02(249)	-0.8077	-0.8077	-0.8076	-0.8057	-0.7962	-0.7850	-0.7833	mean
°C	0.0176	0.0152	0.0142	0.0142	0.0173	0.0173	0.0238	std.
	-0.2222	0.1716	0.0693	-0.0942	0.2151	0.0715	0.2267	skew
03(249)	-0.8148	-0.8085	-0.8171	-0.8158	-0.8085	-0.7846	-0.7854	mean
°C	0.0162	0.0153	0.0150	0.0150	0.0167	0.0176	0.0242	std.
	0.0372	0.1406	0.7175	-0.1181	0.7626	-0.0584	0.1148	skew
I1(249)	-0.8100	-0.8045	-0.8027	-0.8109	-0.8008	-0.7799	-0.7797	mean
°C	0.0175	0.0166	0.0144	0.0145	0.0170	0.0172	0.0217	std.
	0.1711	0.1176	0.0076	0.2568	0.0206	-0.1459	-0.1009	skew
I2(249)	-0.8160	-0.8162	-0.8098	-0.8143	-0.8070	-0.7931	-0.7860	mean
°C	0.0183	0.0139	0.0155	0.0144	0.0165	0.0195	0.0210	std.
	-0.1025	-0.1839	-0.0979	0.0815	0.3909	0.2482	0.1042	skew
I3(253)	-0.7353	-0.7283	-0.7293	-0.7307	-0.7230	-0.7055	-0.7102	mean
°C	0.0184	0.0151	0.0127	0.0150	0.0147	0.0205	0.0207	std.
	0.1854	0.1633	0.1265	-0.1343	0.2184	-0.2643	-0.0501	skew
I3(253)	250.0	250.1	250.1	250.1	250.0	249.8	249.7	mean
m	0.0633	0.0386	0.0464	0.0534	0.1418	0.2166	0.2370	std.
	-0.5292	1.0775	0.7641	0.3521	-1.3896	-1.6728	-0.9433	skew
C(242)	-0.9542	-0.9432	-0.9411	-0.9595	-0.9501	-0.9262	-0.9163	mean
°C	0.0181	0.0192	0.0160	0.0153	0.0163	0.0212	0.0226	std.
	0.2475	-0.6595	-0.6159	-0.3500	0.3150	-0.6698	-0.0514	skew
C(262)	-0.5265	-0.5287	-0.4906	-0.5019	-0.5086	-0.5385	-0.5338	mean
°C	0.0225	0.0173	0.0204	0.0174	0.0141	0.0160	0.0260	std.
	0.2232	0.1807	-0.2394	-0.6464	0.4951	0.0276	0.2224	skew
C(508)	507.5	507.6	507.6	507.6	507.3	506.7	506.7	mean
m	0.0910	0.0555	0.0583	0.0828	0.3804	0.6239	0.7877	std.
	-1.1281	0.2198	-0.0823	-0.2570	-1.3859	-1.4915	-0.9415	skew

	APR 12 JD 102	APR 13 JD 103	APR 14 JD 104	APR 15 JD 105	APR 16 JD 106	APR 17 JD 107	APR 18 JD 108	
C(80)	-1.3234	-1.3283	-1.3299	-1.3233	-1.3235	-1.3211	-1.3223	mean
°C	0.0034	0.0049	0.0041	0.0042	0.0051	0.0046	0.0067	std.
	-0.3505	0.0167	1.2406	-0.5481	0.3348	2.0660	0.4975	skew
C(80)	2.5706	2.5710	2.5709	2.5703	2.5681	2.5691	2.5708	mean
S/m	0.0012	0.0010	0.0007	0.0012	0.0012	0.0022	0.0020	std.
	-0.8748	-0.1414	-0.1733	-0.3448	-0.5133	0.4790	-0.2177	skew
C(185)	-1.5131	-1.5153	-1.5149	-1.5146	-1.5042	-1.4809	-1.5242	mean
°C	0.0031	0.0028	0.0024	0.0036	0.0063	0.0146	0.0092	std.
	0.7965	0.5415	0.2100	1.2117	1.3081	-0.8231	-0.3233	skew
C(185)	2.6523	2.6525	2.6525	2.6528	2.6536	2.6552	2.6510	mean
S/m	0.0007	0.0006	0.0006	0.0009	0.0008	0.0015	0.0013	std.
	0.6017	0.3154	-0.3775	0.3296	-0.0993	-0.3904	-0.2519	skew
C(257)	-0.6336	-0.6238	-0.6180	-0.6197	-0.6129	-0.6208	-0.6214	mean
°C	0.0182	0.0170	0.0164	0.0173	0.0160	0.0189	0.0256	std.
	-0.5808	-0.3370	0.0969	-0.1093	-0.0885	0.1039	0.6454	skew
C(257)	2.8019	2.8031	2.8029	2.8025	2.8032	2.8034	2.8030	mean
S/m	0.0022	0.0021	0.0018	0.0019	0.0019	0.0024	0.0034	std.
	-1.1234	-0.5718	0.1323	-0.1861	-0.3904	-0.2940	0.5905	skew
C(303)	-0.0640	-0.0734	-0.0737	-0.0401	-0.0421	-0.0601	-0.0644	mean
°C	0.0177	0.0066	0.0081	0.0203	0.0147	0.0123	0.0149	std.
	0.5353	-0.1876	-0.5904	-1.2286	-1.3125	0.1552	-0.5173	skew
C(303)	2.8770	2.8767	2.8765	2.8793	2.8789	2.8777	2.8770	mean
S/m	0.0017	0.0010	0.0009	0.0021	0.0014	0.0014	0.0018	std.
	0.5001	-0.1305	0.1551	-1.2942	-1.1301	0.2733	-0.5875	skew
C(508)	0.5004	0.5006	0.4992	0.4994	0.4998	0.4974	0.5002	mean
°C	0.0016	0.0013	0.0014	0.0010	0.0012	0.0021	0.0020	std.
	-1.1055	-0.6888	-0.1332	0.5490	-1.1989	0.4780	-0.1849	skew
C(508)	2.9587	2.9591	2.9586	2.9585	2.9583	2.9579	2.9581	mean
S/m	0.0004	0.0008	0.0004	0.0003	0.0002	0.0002	0.0002	std.
	-0.0741	0.7535	1.1964	1.5914	-1.7735	1.0450	-0.4624	skew

	APR 19 JD 109	APR 20 JD 110	APR 21 JD 111	APR 22 JD 112	APR 23 JD 113	APR 24 JD 114	APR 25 JD 115	
01(249)	-0.8035	-0.8078	-0.7780	-0.7747	-0.8276	-0.8384	-0.5294	mean
°C	0.0209	0.0157	0.0184	0.0158	0.0236	0.0487	0.0773	std.
	0.1172	-0.8505	-0.0676	-0.0962	0.2433	1.5335	-0.4861	skew
02(249)	-0.8082	-0.8095	-0.7736	-0.7725	-0.8245	-0.8216	-0.5521	mean
°C	0.0215	0.0211	0.0205	0.0226	0.0269	0.0470	0.0673	std.
	0.0580	-0.2675	-0.1072	-0.0241	-0.1003	1.3875	-0.4092	skew
03(249)	-0.7941	-0.7984	-0.7759	-0.7694	-0.8202	-0.8325	-0.5733	mean
°C	0.0196	0.0203	0.0183	0.0185	0.0263	0.0298	0.0809	std.
	-0.2053	-0.1871	0.1677	-0.2012	0.3581	0.9666	-0.4069	skew
11(249)	-0.7940	-0.8006	-0.7732	-0.7649	-0.8228	-0.8354	-0.5404	mean
°C	0.0196	0.0211	0.0202	0.0153	0.0236	0.0453	0.0746	std.
	-0.0228	-0.6161	-0.0454	0.5971	0.2515	1.1281	-0.6026	skew
12(249)	-0.8046	-0.8145	-0.7816	-0.7787	-0.8290	-0.8388	-0.5509	mean
°C	0.0217	0.0197	0.0210	0.0162	0.0239	0.0444	0.0708	std.
	-0.2354	-0.1567	0.1673	0.2150	0.1549	1.3994	-0.5287	skew
13(253)	-0.7228	-0.7255	-0.7018	-0.6937	-0.7328	-0.7402	-0.4900	mean
°C	0.0193	0.0183	0.0190	0.0119	0.0215	0.0450	0.0703	std.
	0.0111	0.2822	-0.2668	0.0810	0.0473	1.0551	-0.5286	skew
13(253)	250.0	250.1	250.1	250.2	250.0	250.0	249.5	mean
m	0.2526	0.0568	0.0591	0.0464	0.1737	0.1135	0.6604	std.
	-1.5942	-0.1142	-0.0560	-0.4111	-0.9724	-0.8585	-1.6829	skew
C(242)	-0.9248	-0.9553	-0.8904	-0.9359	-0.9534	-0.9632	-0.6357	mean
°C	0.0179	0.0249	0.0308	0.0232	0.0254	0.0450	0.0895	std.
	0.2572	0.3065	-1.0103	0.4980	0.2610	0.9698	-0.6329	skew
C(262)	-0.5390	-0.5492	-0.5226	-0.5224	-0.5571	-0.5607	-0.3452	mean
°C	0.0179	0.0176	0.0175	0.0110	0.0179	0.0426	0.0508	std.
	-0.1473	0.1175	-0.0442	-0.3046	-0.1284	1.2241	-0.3145	skew
C(508)	507.4	507.6	507.6	507.7	507.3	507.4	507.1	mean
m	0.5302	0.1145	0.1274	0.0528	0.4487	0.2445	0.7340	std.
	-1.7871	-1.9813	-1.9102	-0.2232	-1.2399	-1.8395	-2.4892	skew

	APR 19 JD 109	APR 20 JD 110	APR 21 JD 111	APR 22 JD 112	APR 23 JD 113	APR 24 JD 114	APR 25 JD 115	
C(80)	-1.3485	-1.3951	-1.3420	-1.3836	-1.3661	-1.3530	-1.3653	mean
°C	0.0496	0.0623	0.0185	0.0472	0.0230	0.0125	0.0225	std.
	-3.5235	-0.9822	-4.0670	-2.0986	-1.5101	-0.7131	0.1459	skew
C(80)	2.5741	2.5723	2.5771	2.5759	2.5791	2.5825	2.5663	mean
S/m	0.0041	0.0054	0.0021	0.0037	0.0026	0.0017	0.0109	std.
	-2.3090	-1.0449	-1.9783	-1.7958	-1.6524	-0.6577	0.0490	skew
C(185)	-1.5187	-1.5151	-1.5104	-1.5112	-1.5086	-1.5064	-1.3857	mean
°C	0.0154	0.0109	0.0097	0.0106	0.0116	0.0131	0.0673	std.
	0.0998	0.6232	1.3114	0.9415	-1.9244	-0.7981	0.0482	skew
C(185)	2.6517	2.6532	2.6548	2.6555	2.6560	2.6590	2.6851	mean
S/m	0.0018	0.0014	0.0013	0.0013	0.0014	0.0019	0.0129	std.
	0.1392	-0.0806	-0.1780	0.3527	-2.0959	-0.0731	-0.0330	skew
C(257)	-0.6284	-0.6333	-0.6055	-0.6069	-0.6408	-0.6491	-0.4138	mean
°C	0.0189	0.0149	0.0168	0.0115	0.0199	0.0465	0.0647	std.
	0.1618	-0.1887	-0.5039	0.0340	-0.4764	1.0707	-0.5156	skew
C(257)	2.8023	2.8019	2.8065	2.8064	2.8009	2.8002	2.8324	mean
S/m	0.0024	0.0017	0.0019	0.0014	0.0028	0.0062	0.0087	std.
	0.1092	0.0283	-0.3928	0.2503	-0.4424	1.1084	-0.5569	skew
C(303)	-0.0800	-0.0826	-0.0893	-0.1144	-0.1065	-0.0784	0.0366	mean
°C	0.0137	0.0109	0.0096	0.0217	0.0204	0.0310	0.0325	std.
	-0.0324	0.3981	0.9280	0.1089	0.0038	-0.2825	-0.6188	skew
C(303)	2.8755	2.8753	2.8760	2.8735	2.8732	2.8759	2.8894	mean
S/m	0.0016	0.0012	0.0010	0.0020	0.0019	0.0033	0.0037	std.
	-0.0615	0.2514	-0.6405	0.2562	-0.0812	-0.2040	-0.6619	skew
C(508)	0.5023	0.5031	0.5060	0.5076	0.5024	0.5048	0.5068	mean
°C	0.0007	0.0021	0.0017	0.0010	0.0028	0.0026	0.0018	std.
	-6.6563	1.1165	-1.5671	0.6826	0.1184	-0.3336	1.0282	skew
C(508)	2.9585	2.9585	2.9596	2.9596	2.9582	2.9584	2.9589	mean
S/m	0.0003	0.0002	0.0011	0.0006	0.0003	0.0003	0.0003	std.
	0.9329	0.4958	0.4536	0.0448	0.4100	-0.4400	-0.5408	skew

	APR 26 JD 116	APR 27 JD 117	APR 28 JD 118	APR 29 JD 119	APR 30 JD 120	
O1(249)	-0.5966	----	----	----	----	mean
°C	0.0415	----	----	----	----	std.
	0.3088	----	----	----	----	skew
O2(249)	-0.6116	----	----	----	----	mean
°C	0.0251	----	----	----	----	std.
	-0.4568	----	----	----	----	skew
O3(249)	-0.6117	-0.6651	-0.6983	-0.7378	----	mean
°C	0.0347	0.0231	0.0211	0.0184	----	std.
	-0.3947	0.1714	0.2237	-0.4893	----	skew
I1(249)	-0.6003	-0.6593	----	----	----	mean
°C	0.0355	0.0164	----	----	----	std.
	0.0704	0.8854	----	----	----	skew
I2(249)	-0.6209	-0.6825	-0.7158	----	----	mean
°C	0.0325	0.0189	0.0193	----	----	std.
	0.0172	0.0765	-0.0150	----	----	skew
I3(253)	-0.5360	-0.5987	-0.6306	-0.6546	----	mean
°C	0.0356	0.0198	0.0199	0.0070	----	std.
	0.0003	-0.0742	0.1462	1.1103	----	skew
I3(253)	249.4	250.0	250.2	250.1	----	mean
m	0.8185	0.2085	0.0447	0.0498	----	std.
	-1.8088	-0.5538	-0.7491	0.4452	----	skew
C(242)	-0.7343	-0.7916	-0.8313	-0.8829	----	mean
°C	0.0359	0.0265	0.0252	0.0148	----	std.
	0.3151	-0.7195	0.2328	0.2294	----	skew
C(262)	-0.3954	-0.4644	-0.4918	-0.4951	----	mean
°C	0.0319	0.0177	0.0156	0.0119	----	std.
	-0.8707	0.0727	0.1662	-0.3749	----	skew
C(508)	506.4	507.2	507.7	507.7	----	mean
m	0.9655	0.6378	0.0586	0.0601	----	std.
	-1.5632	-0.7315	0.0483	-0.0362	----	skew

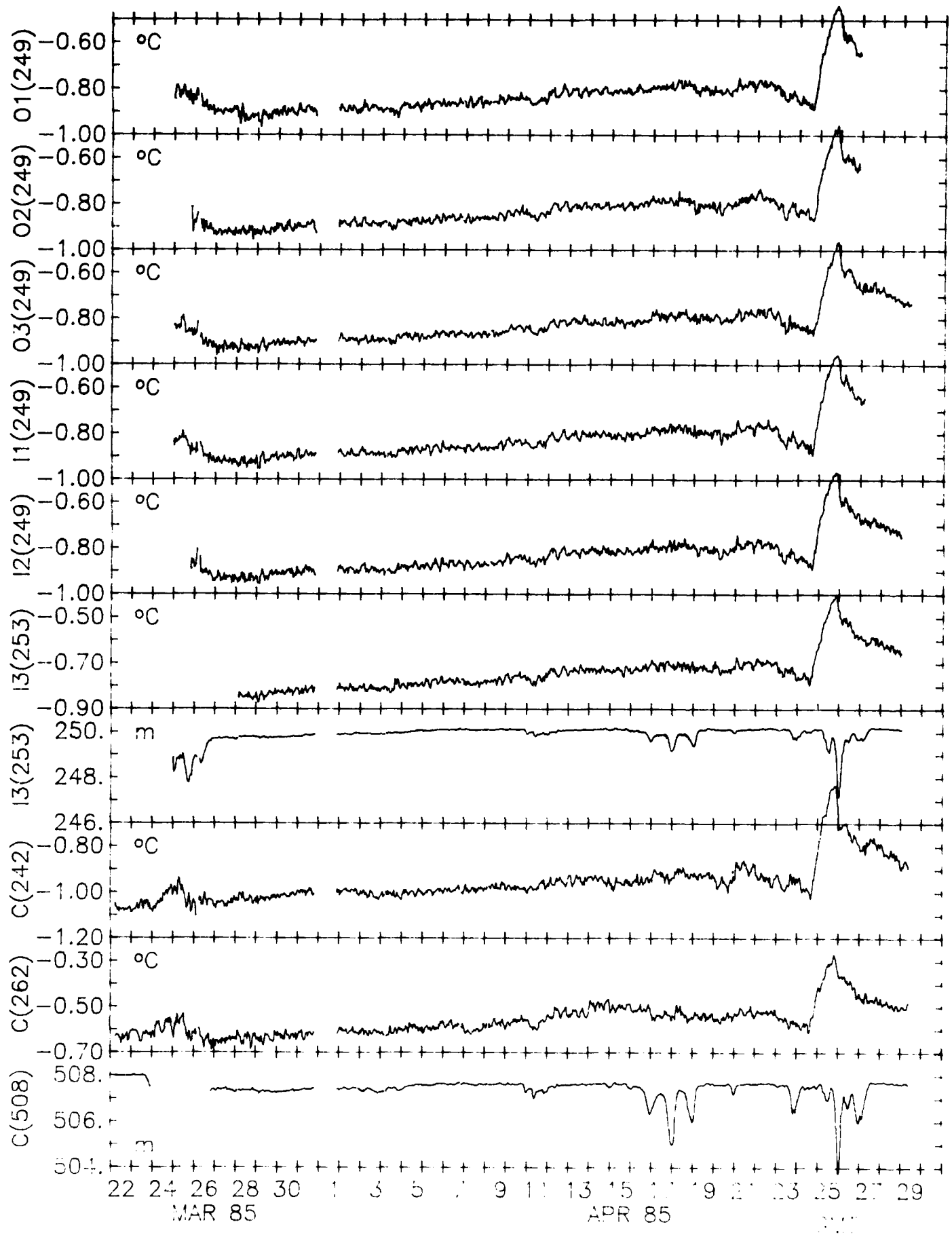
	APR 26 JD 116	APR 27 JD 117	APR 28 JD 118	APR 29 JD 119	APR 30 JD 120	
C(80)	-1.3493	-1.3409	-1.3410	-1.3479	----	mean
°C	0.0166	0.0112	0.0026	0.0081	----	std.
	-0.1385	-2.7417	-0.6283	-1.7161	----	skew
C(80)	2.5754	2.5779	2.5799	2.5813	----	mean
S/m	0.0054	0.0021	0.0009	0.0006	----	std.
	-1.7354	-0.6345	0.1221	-0.4422	----	skew
C(185)	-1.4675	-1.5095	-1.5205	-1.5228	----	mean
°C	0.0413	0.0150	0.0082	0.0028	----	std.
	1.0047	-0.3389	0.4990	0.5288	----	skew
C(185)	2.6680	2.6570	2.6559	2.6554	----	mean
S/m	0.0094	0.0019	0.0010	0.0005	----	std.
	0.7924	0.0783	0.7157	-0.6130	----	skew
C(257)	-0.4661	-0.5302	-0.5521	-0.5781	----	mean
°C	0.0338	0.0152	0.0161	0.0176	----	std.
	-0.4689	-0.1231	0.2729	-0.2243	----	skew
C(257)	2.8252	2.8173	2.8143	2.8100	----	mean
S/m	0.0044	0.0022	0.0023	0.0022	----	std.
	-0.4608	-0.2268	0.2727	-0.2458	----	skew
C(303)	-0.0011	-0.0432	-0.0997	-0.0949	----	mean
°C	0.0304	0.0256	0.0202	0.0133	----	std.
	-0.0017	-0.1675	-0.1117	0.6342	----	skew
C(303)	2.8851	2.8808	2.8755	2.8755	----	mean
S/m	0.0033	0.0026	0.0019	0.0011	----	std.
	-0.0723	0.0401	-0.0087	0.7612	----	skew
C(508)	0.5040	0.5054	0.5020	0.5026	----	mean
°C	0.0028	0.0025	0.0014	0.0010	----	std.
	0.5574	-0.2750	0.0109	-4.5794	----	skew
C(508)	2.9585	2.9586	2.9586	2.9589	----	mean
S/m	0.0002	0.0002	0.0004	0.0003	----	std.
	0.1994	-0.0412	2.7553	0.7445	----	skew

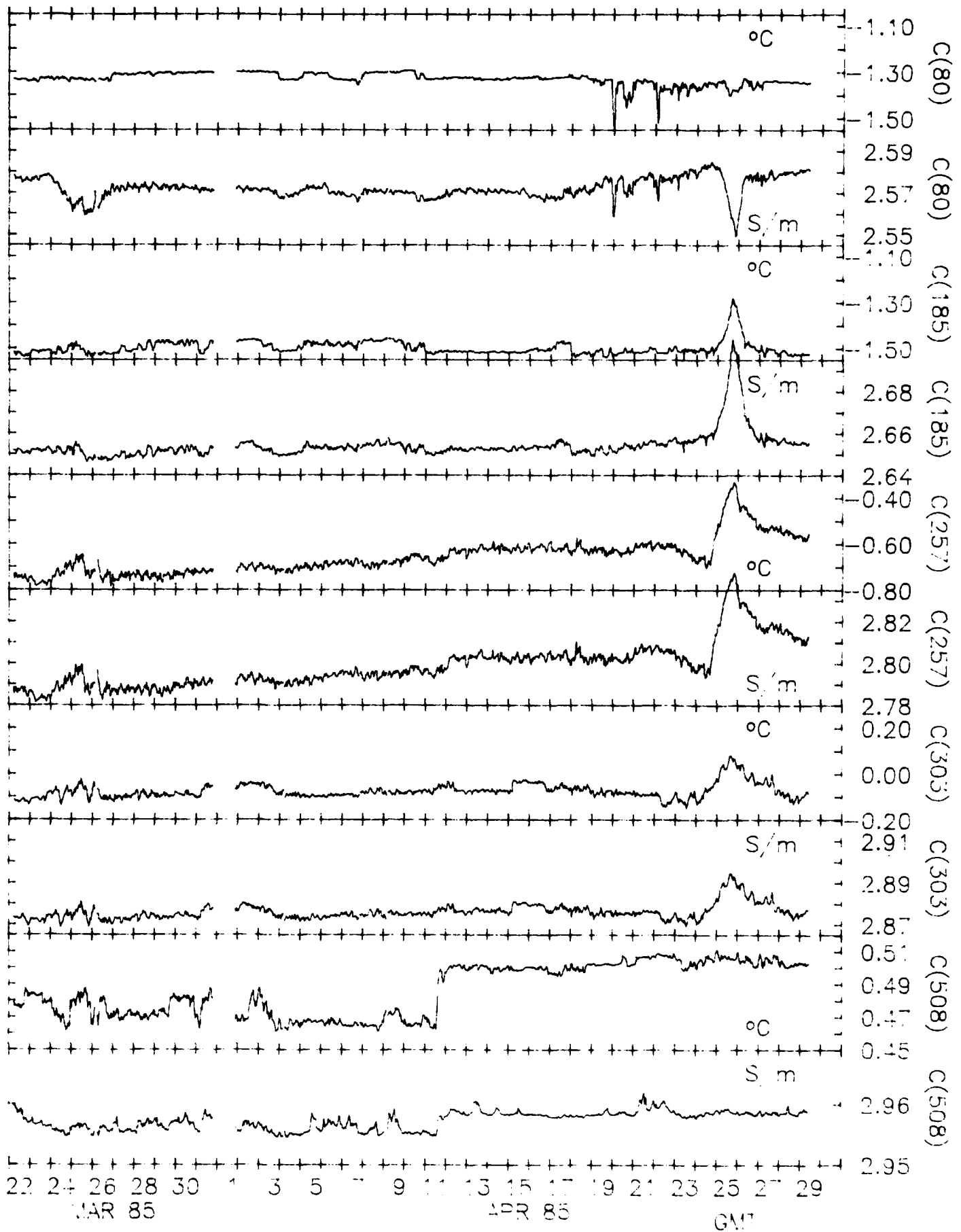
## TIME SERIES OF TEMPERATURE, CONDUCTIVITY, AND PRESSURE

On the following two pages are plots of 15-minute averages of temperature, conductivity, and pressure of the entire experiment. The sensors are plotted with the same resolution except for the temperature and conductivity at 508 m.

PREVIOUS PAGE  
IS BLANK



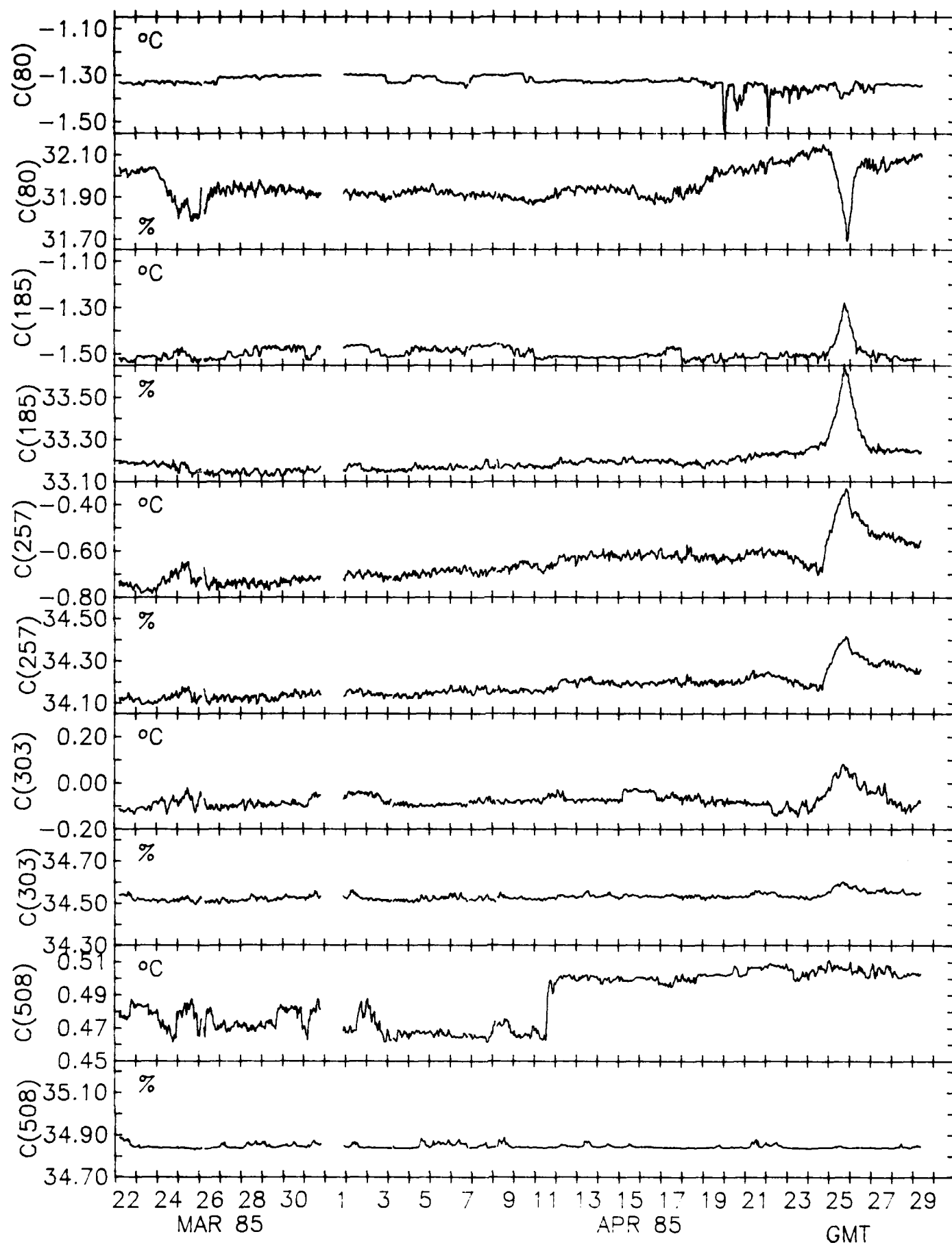




## TIME SERIES OF TEMPERATURE AND SALINITY

The plots on the adjacent page are 15-minute averages of temperature and salinity measured by the 5 temperature-conductivity sensor pairs on the central mooring. Before salinity was calculated temperature was filtered by equation (1) with time constant

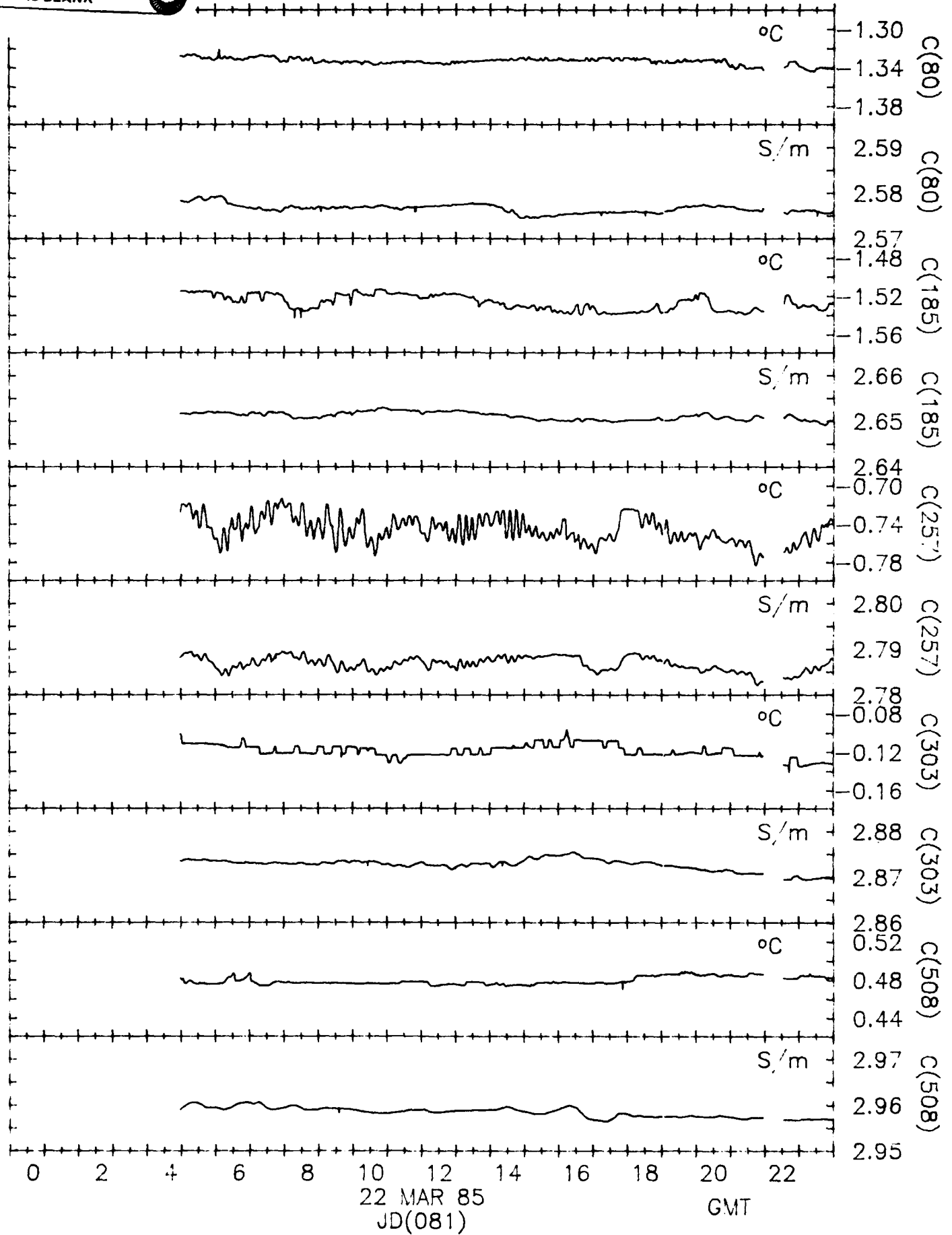
$\tau = 4$  minutes to try to match the time constant of the conductivity sensors. The sensors are plotted with the same resolution except for the temperature and conductivity at 508 m.

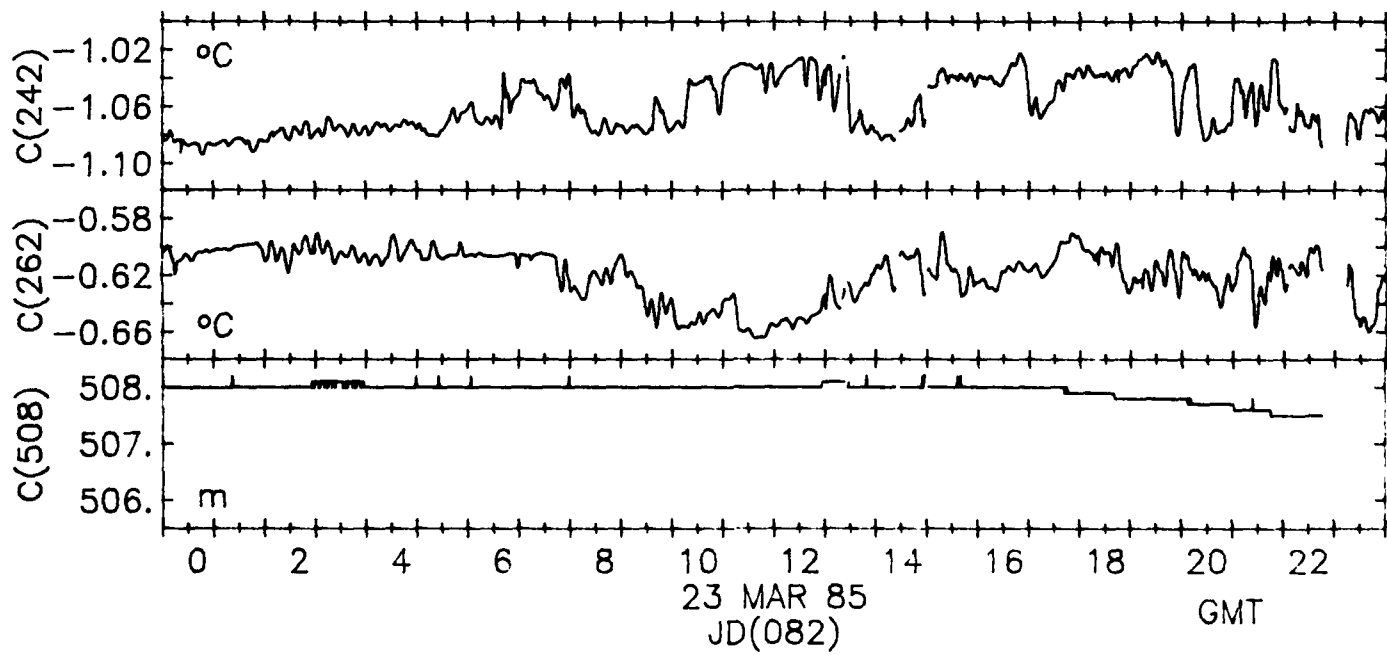


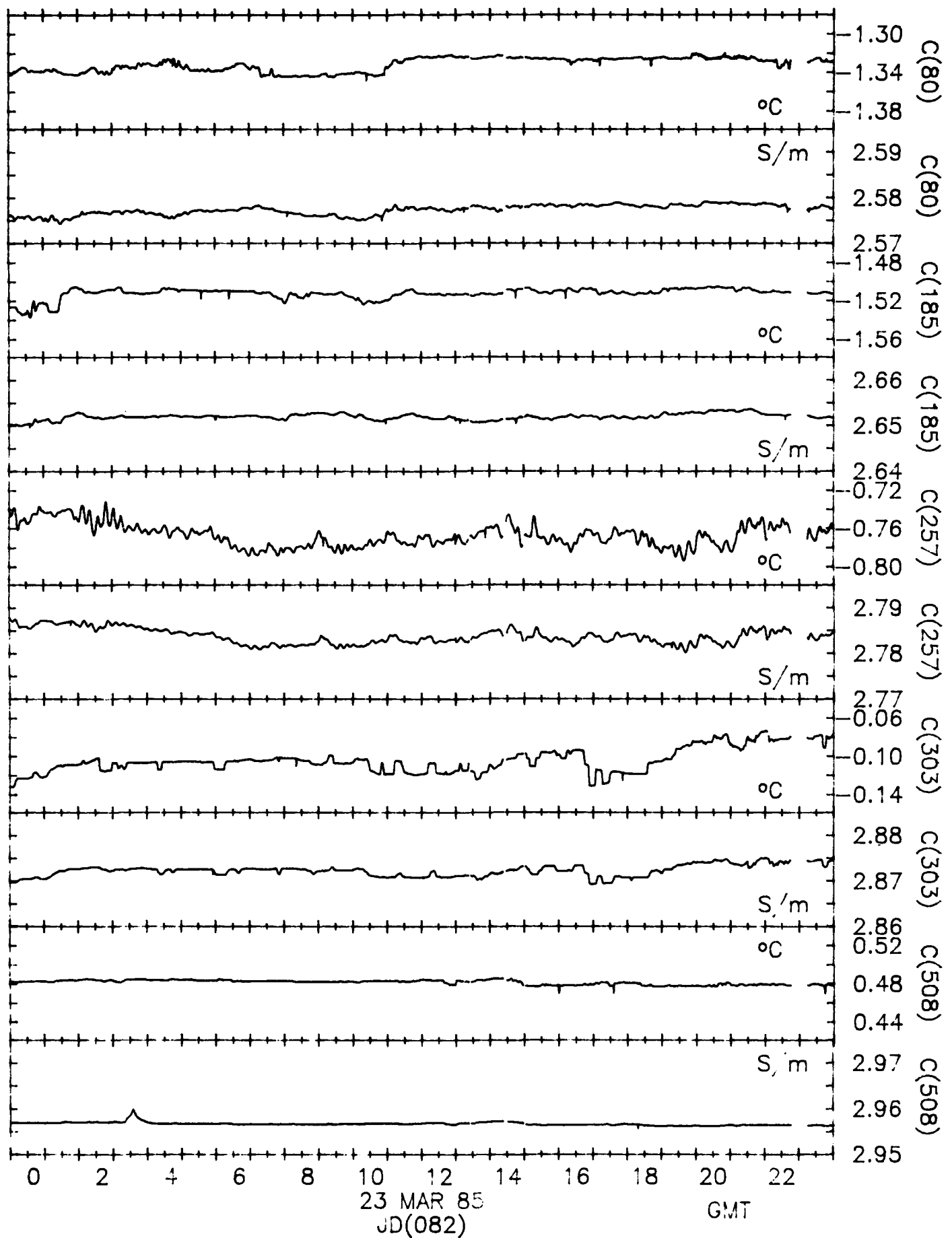
PREVIOUS PAGE  
IS BLANK

# TIME SERIES OF TEMPERATURE, CONDUCTIVITY, AND PRESSURE

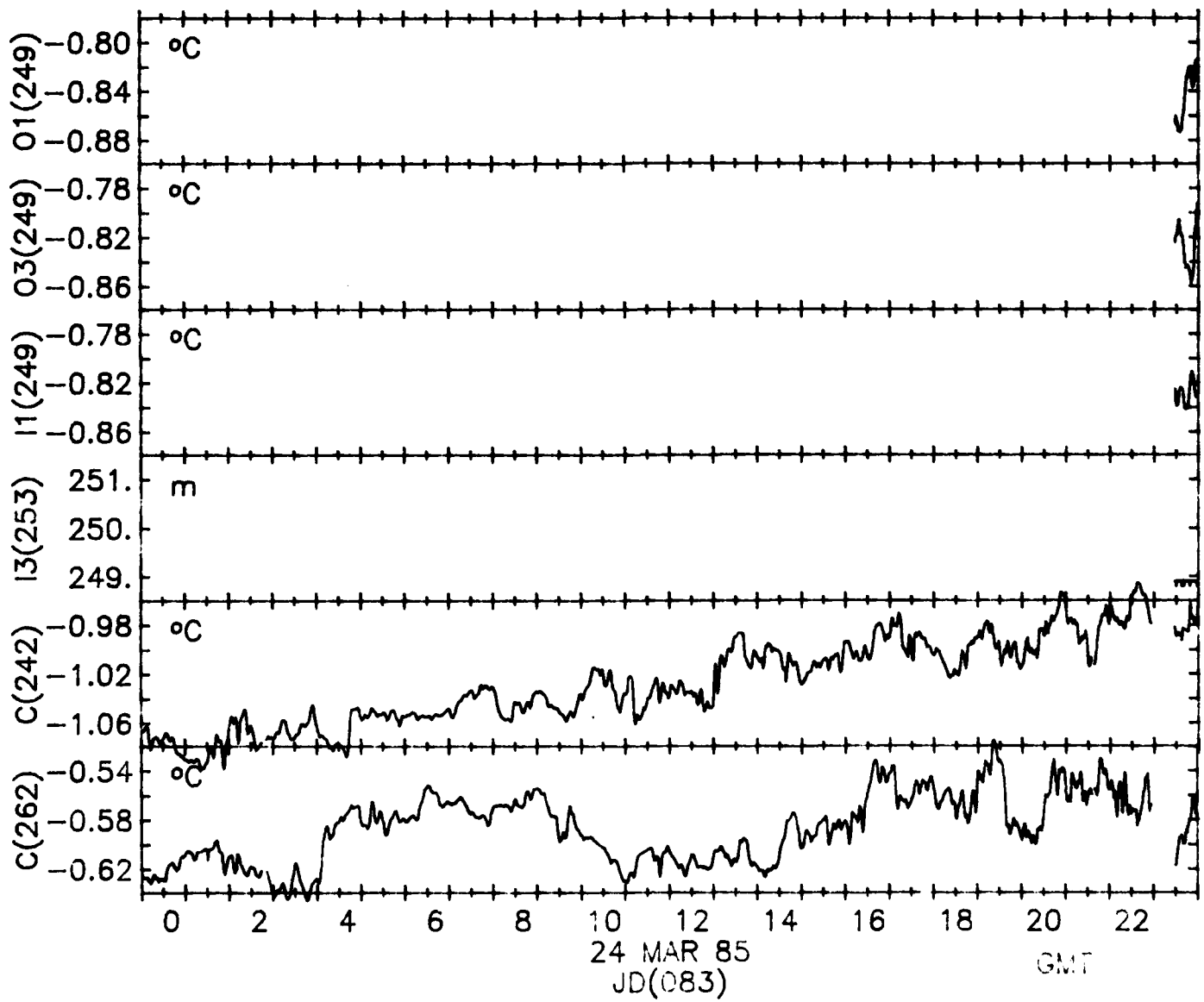
The one-minute averages of temperature, conductivity, and pressure are plotted at one day per page. The series are plotted with the same resolution of temperature, conductivity and depth.

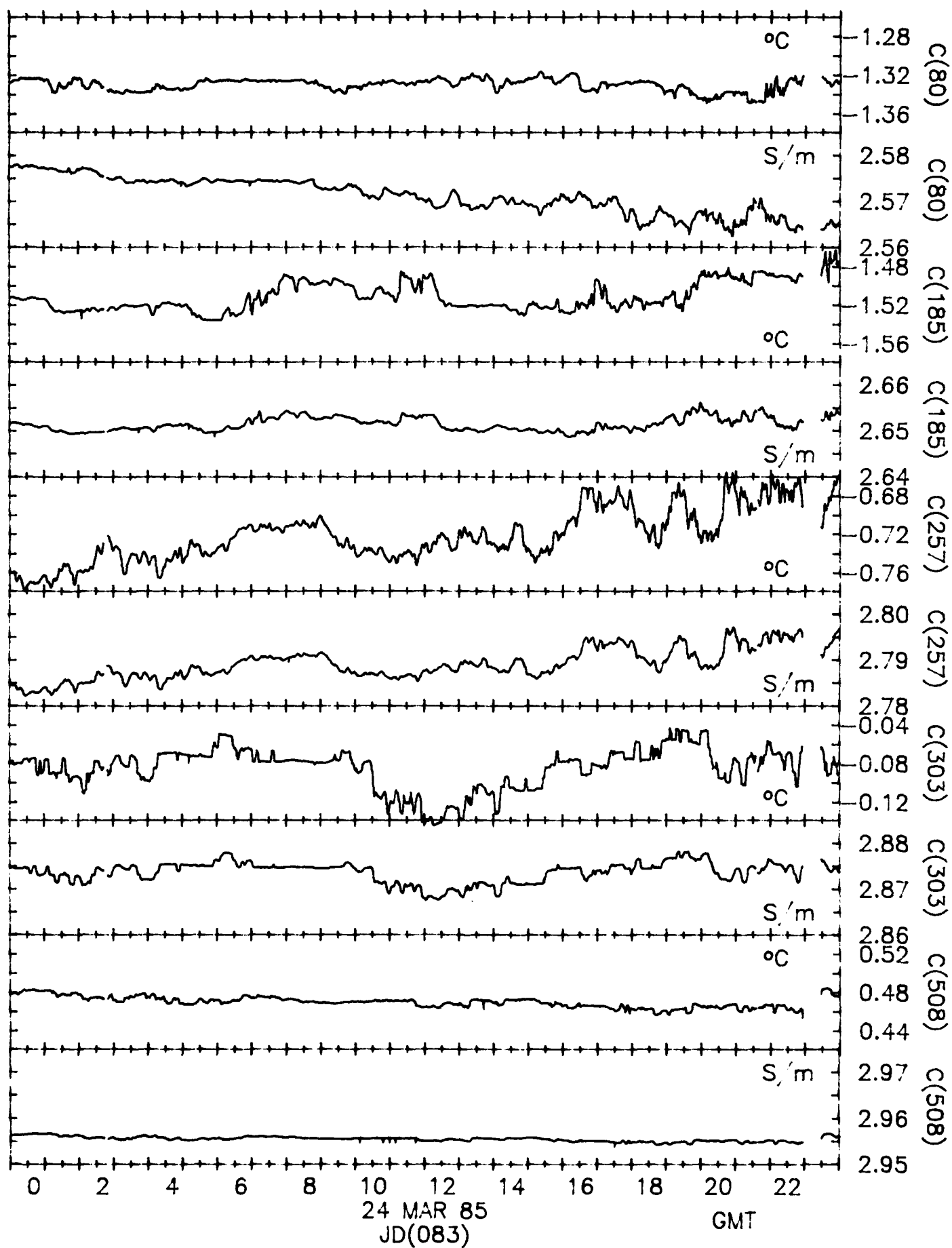
PREVIOUS PAGE  
IS BLANK

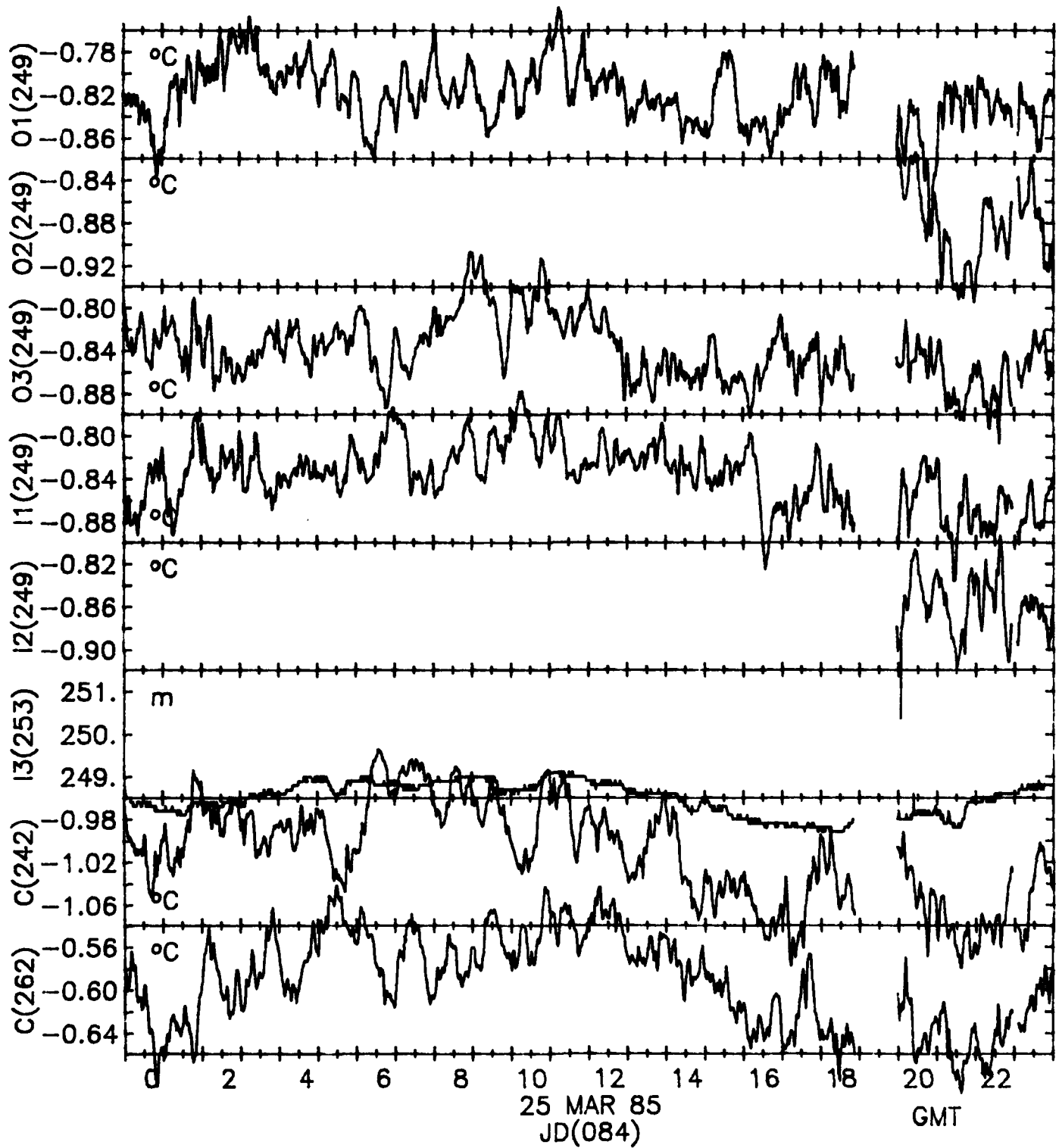


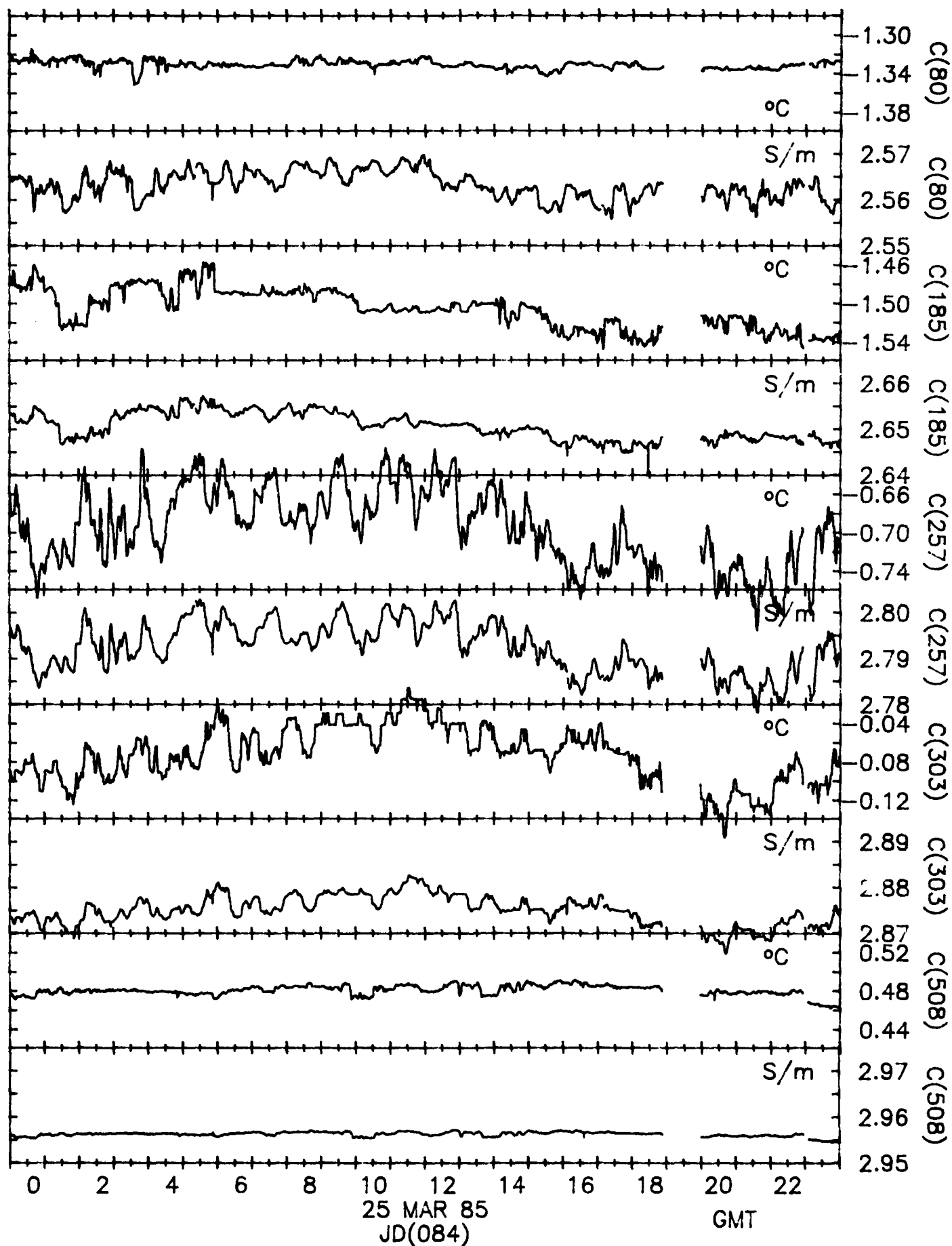


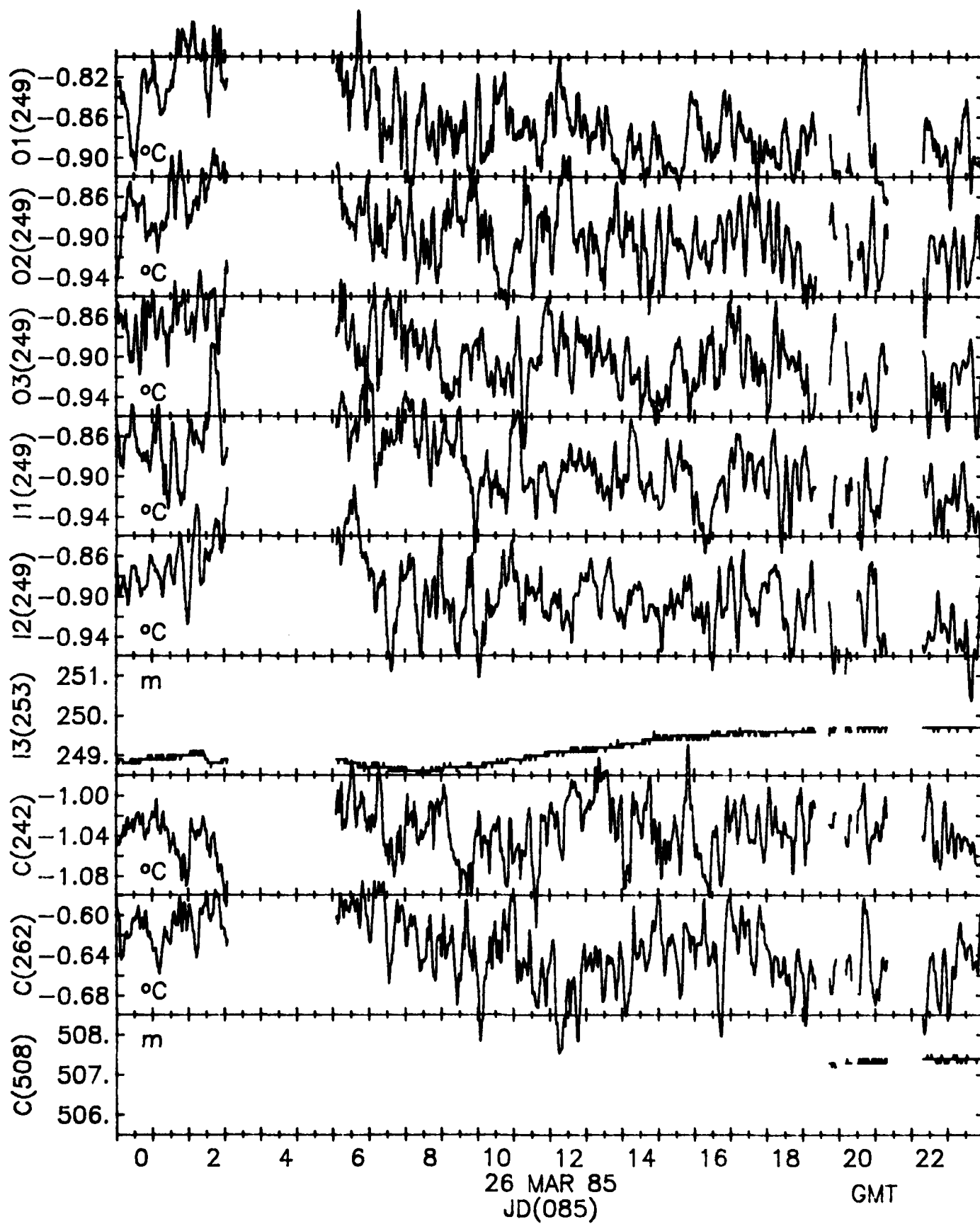


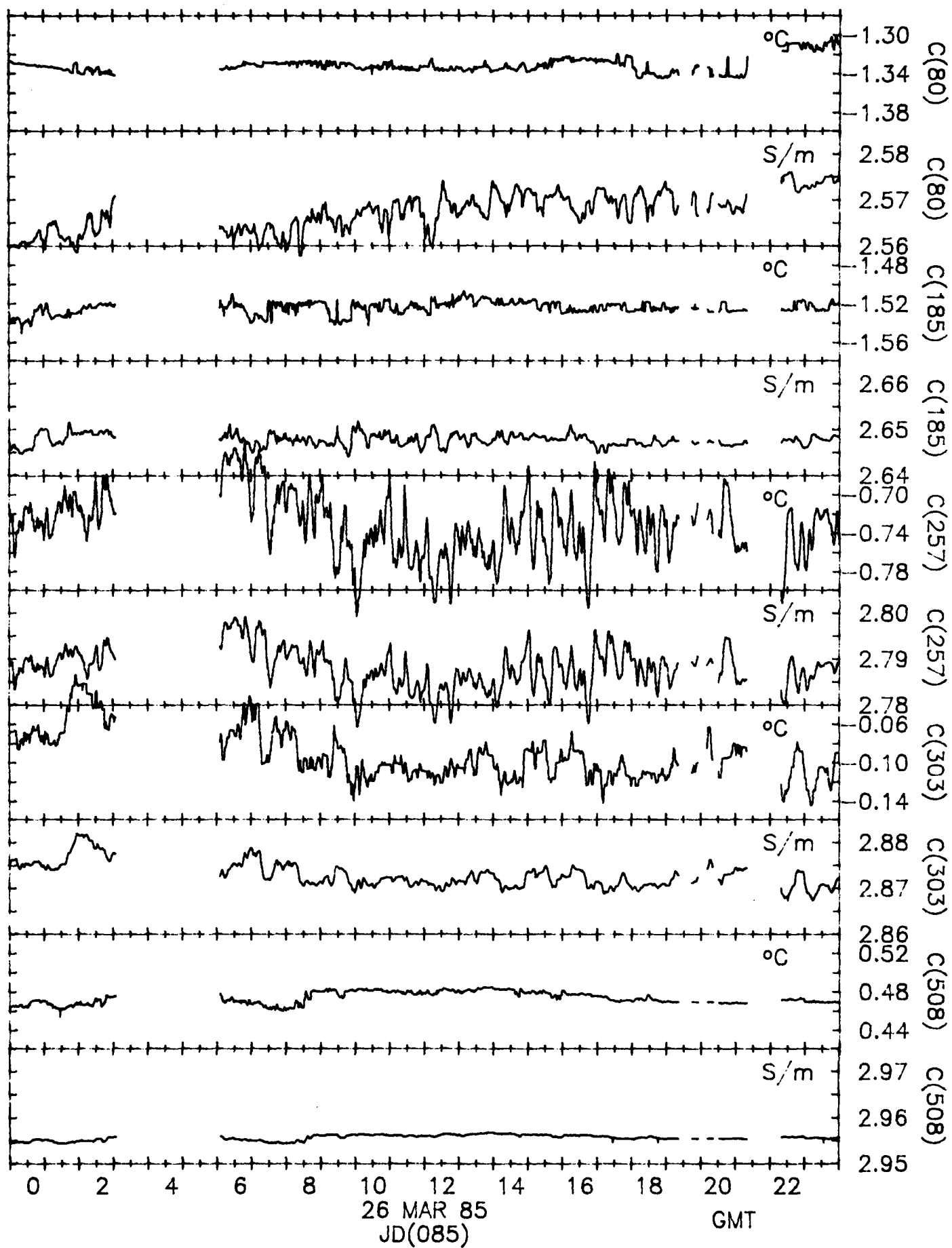


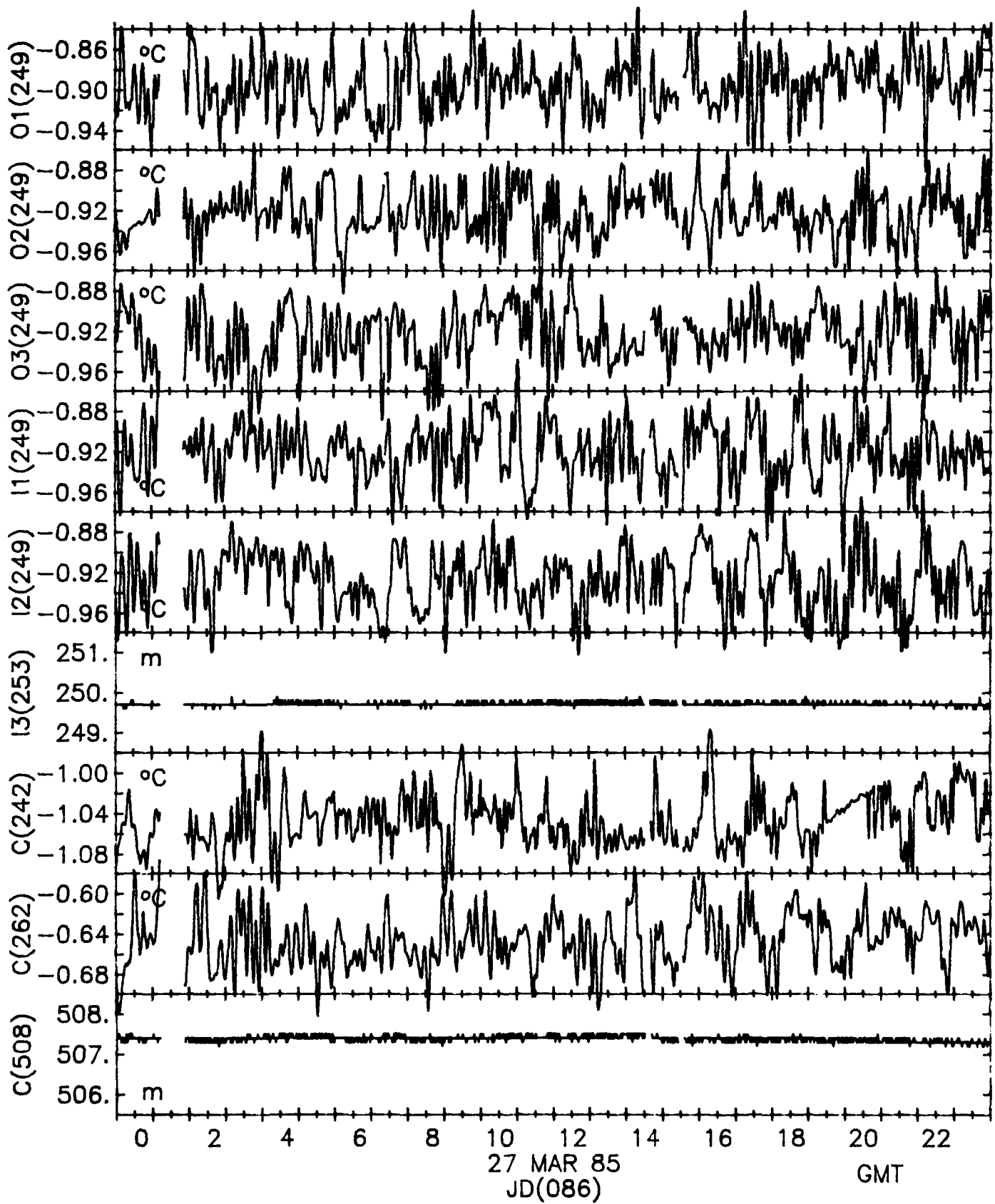


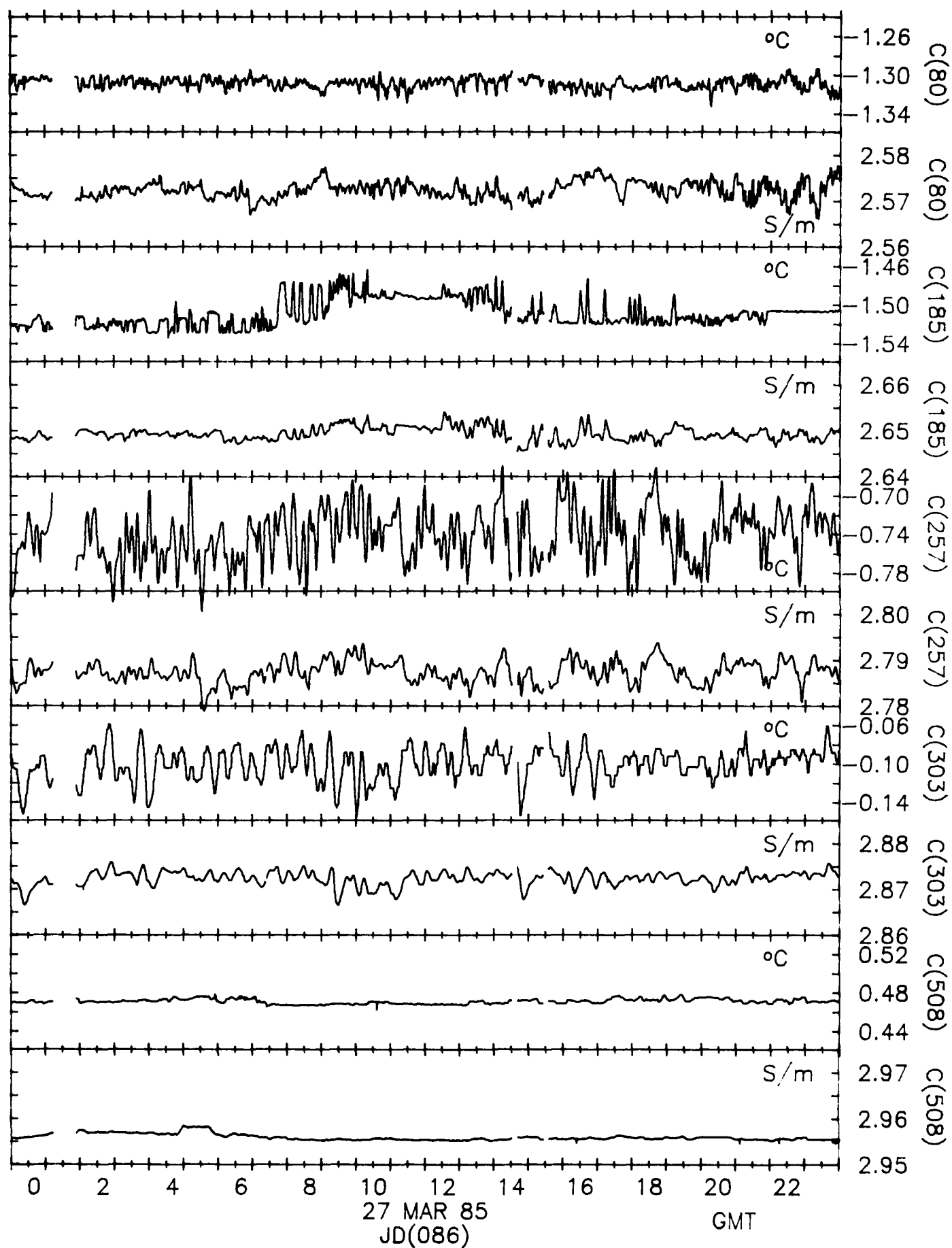




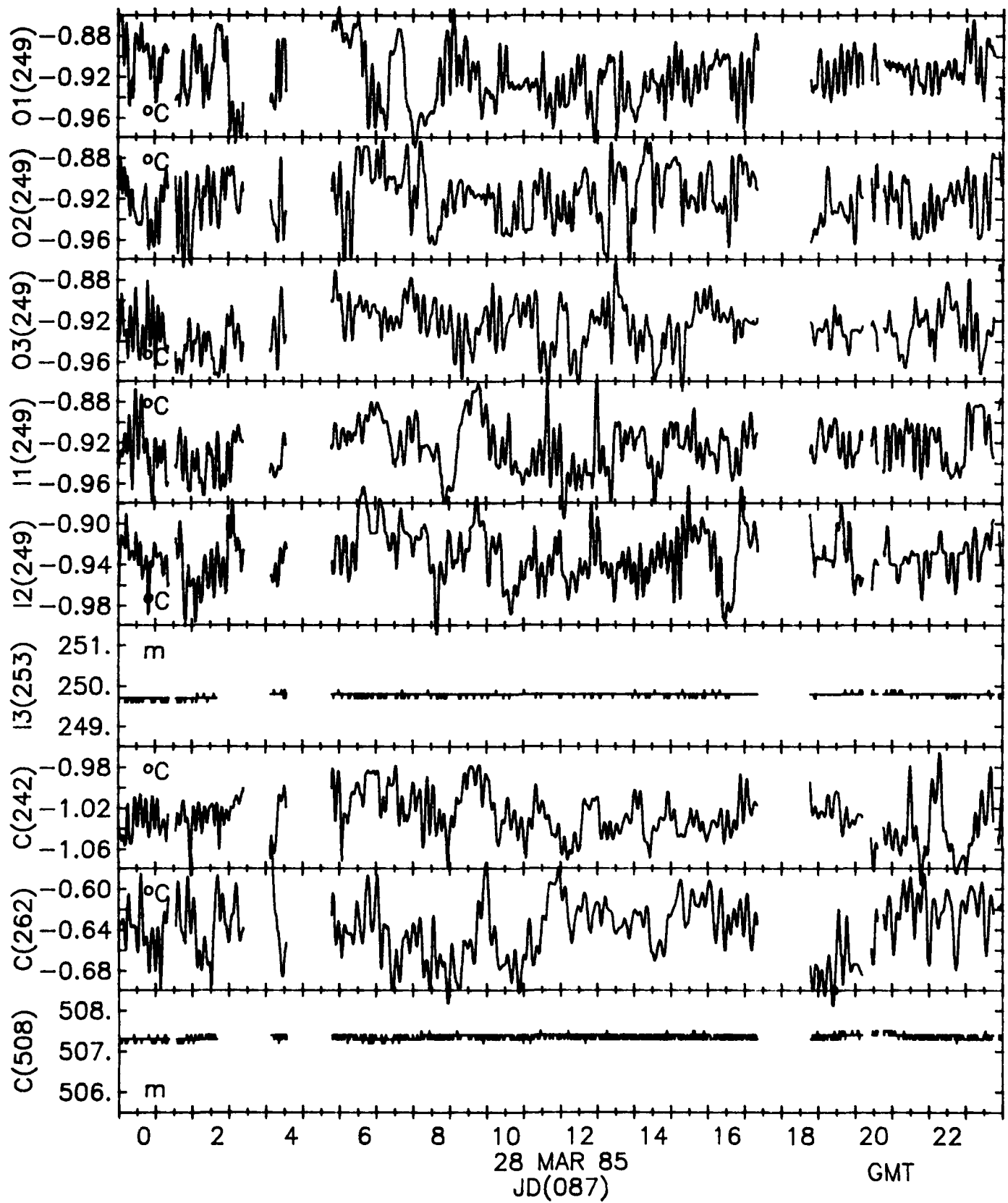


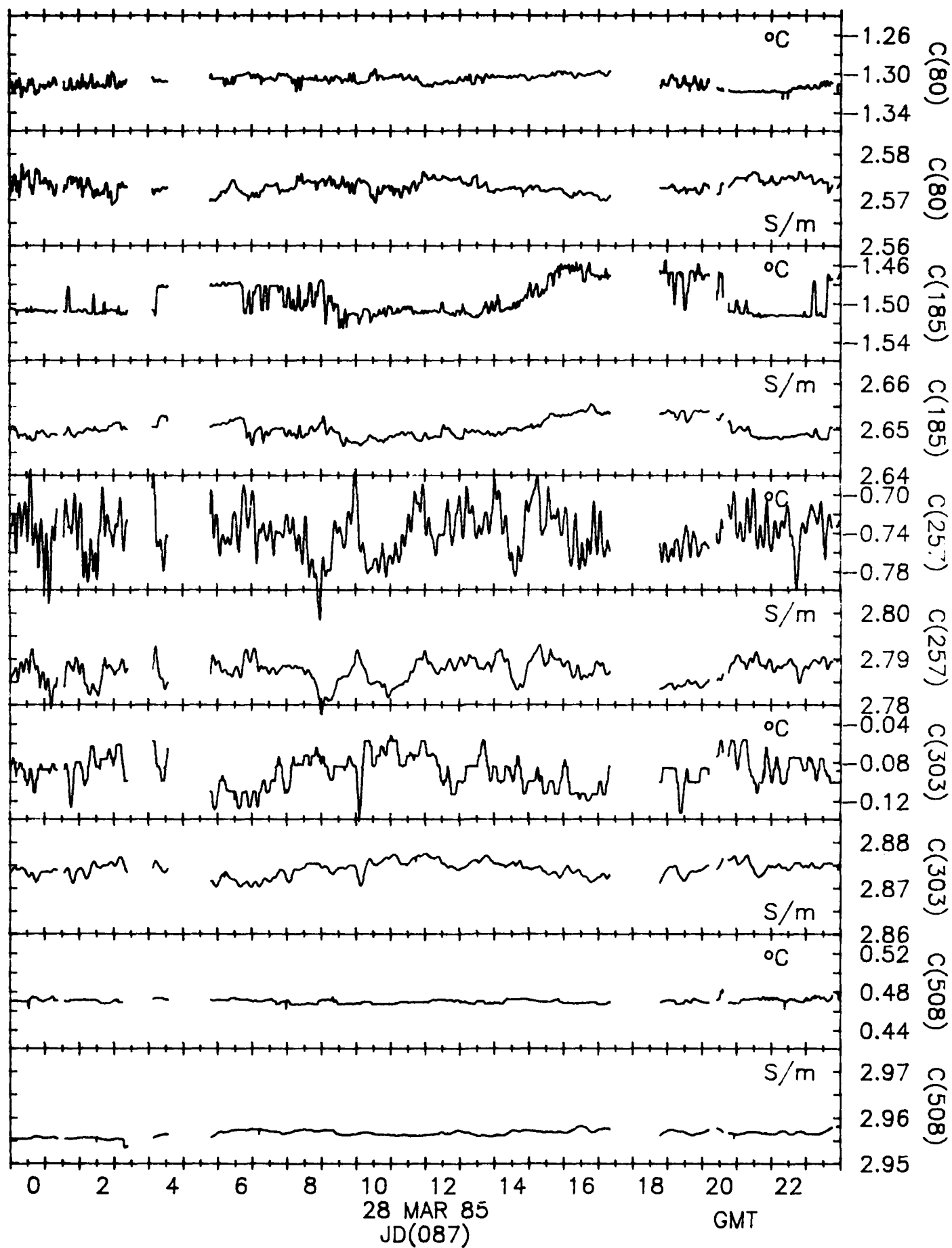


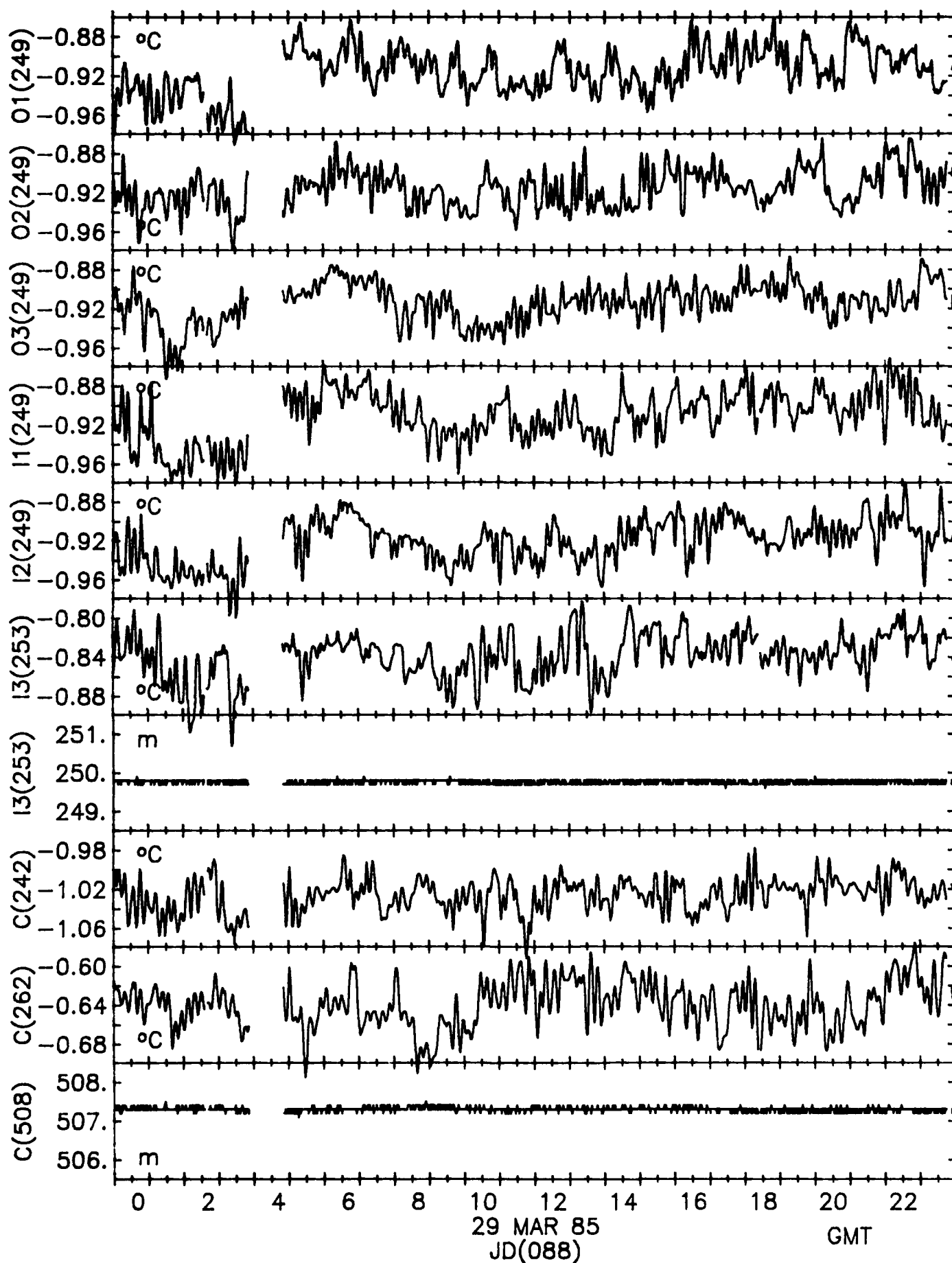


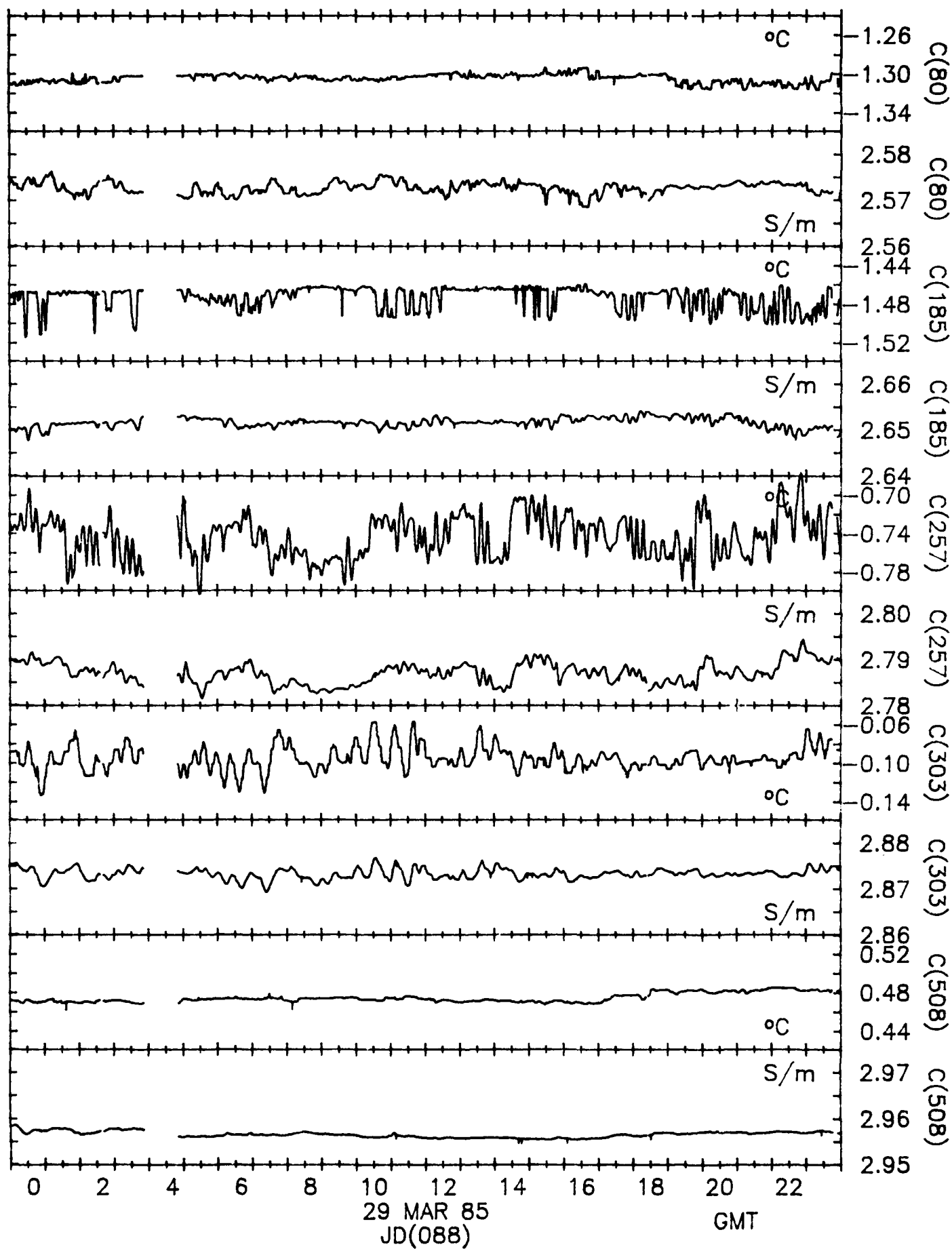


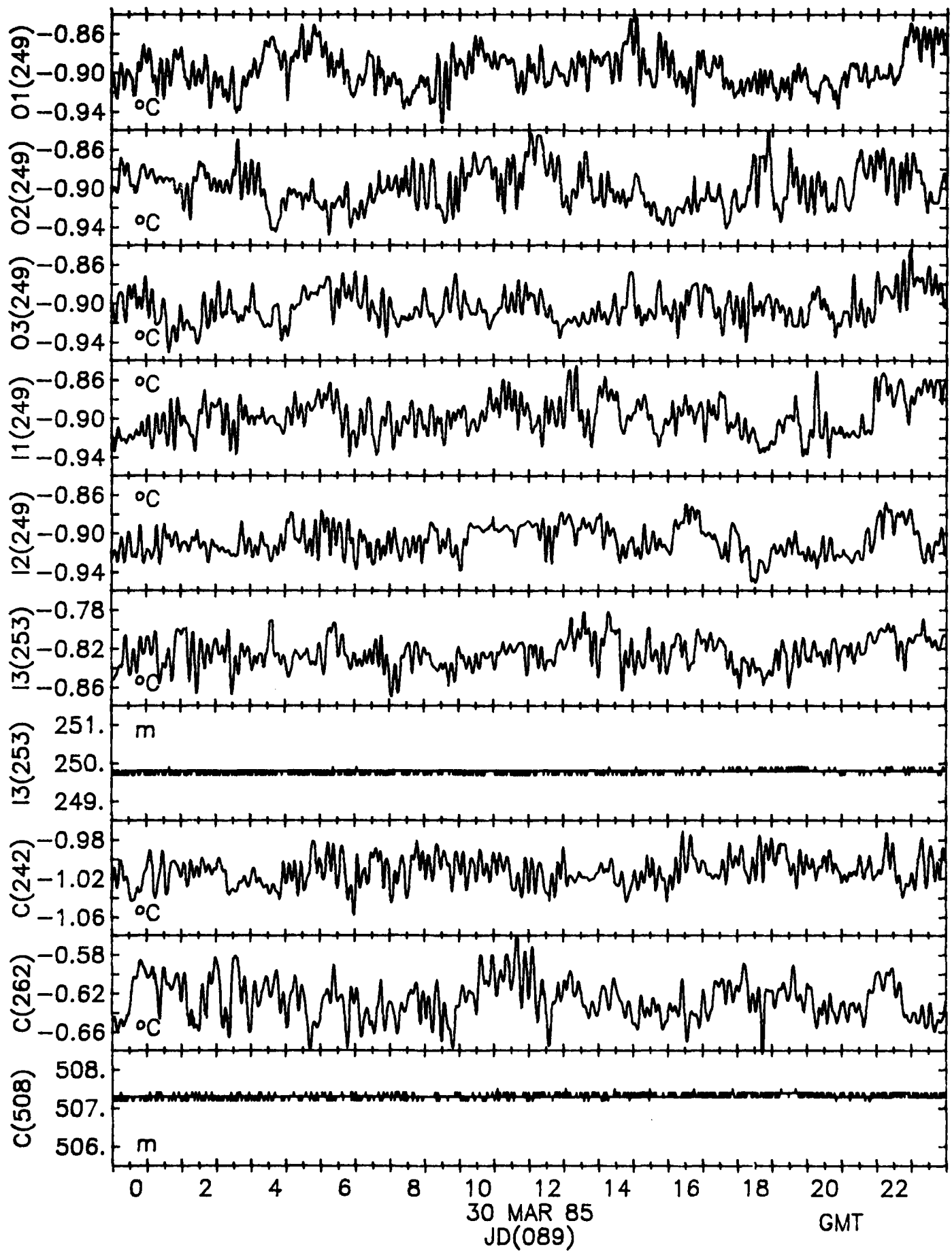


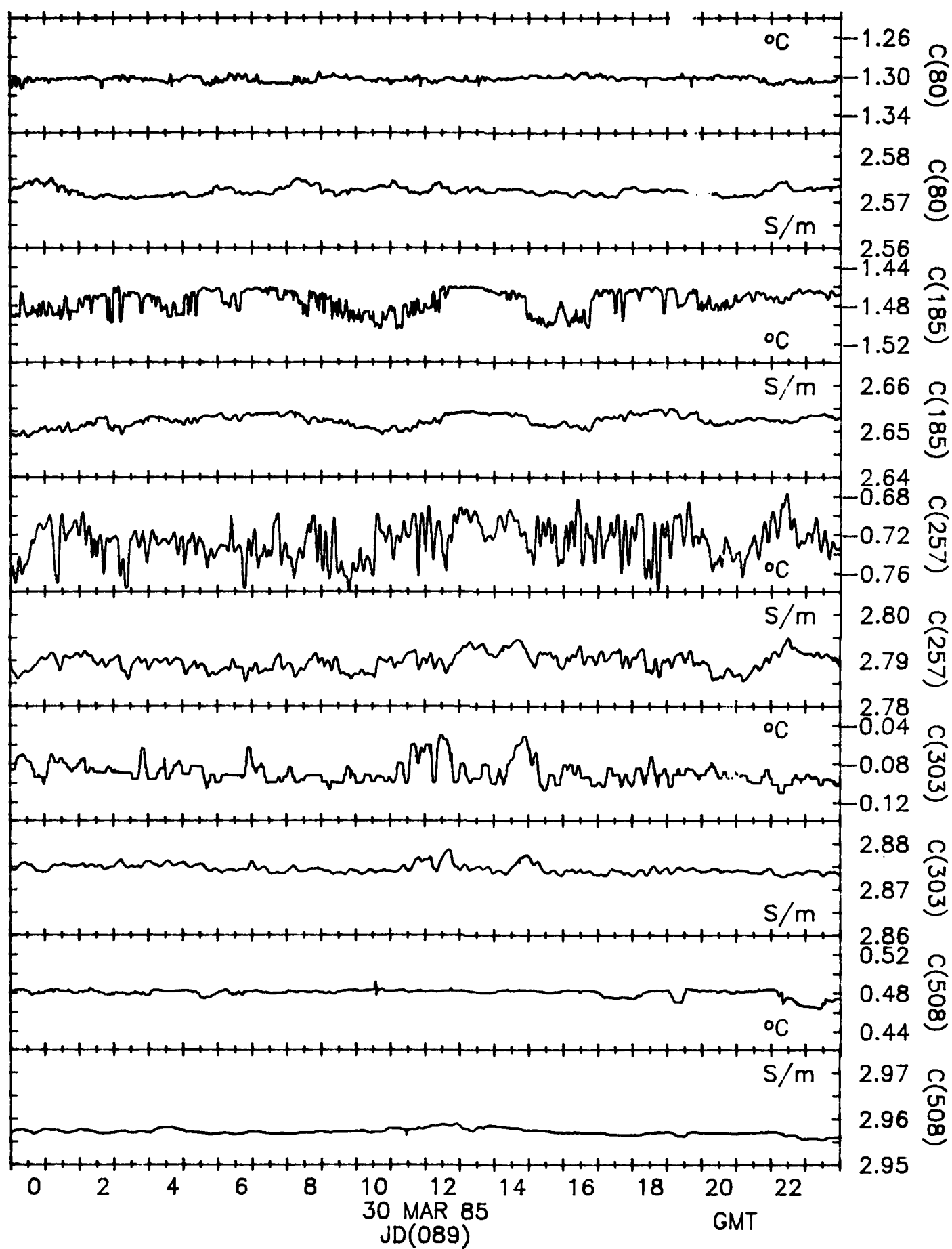


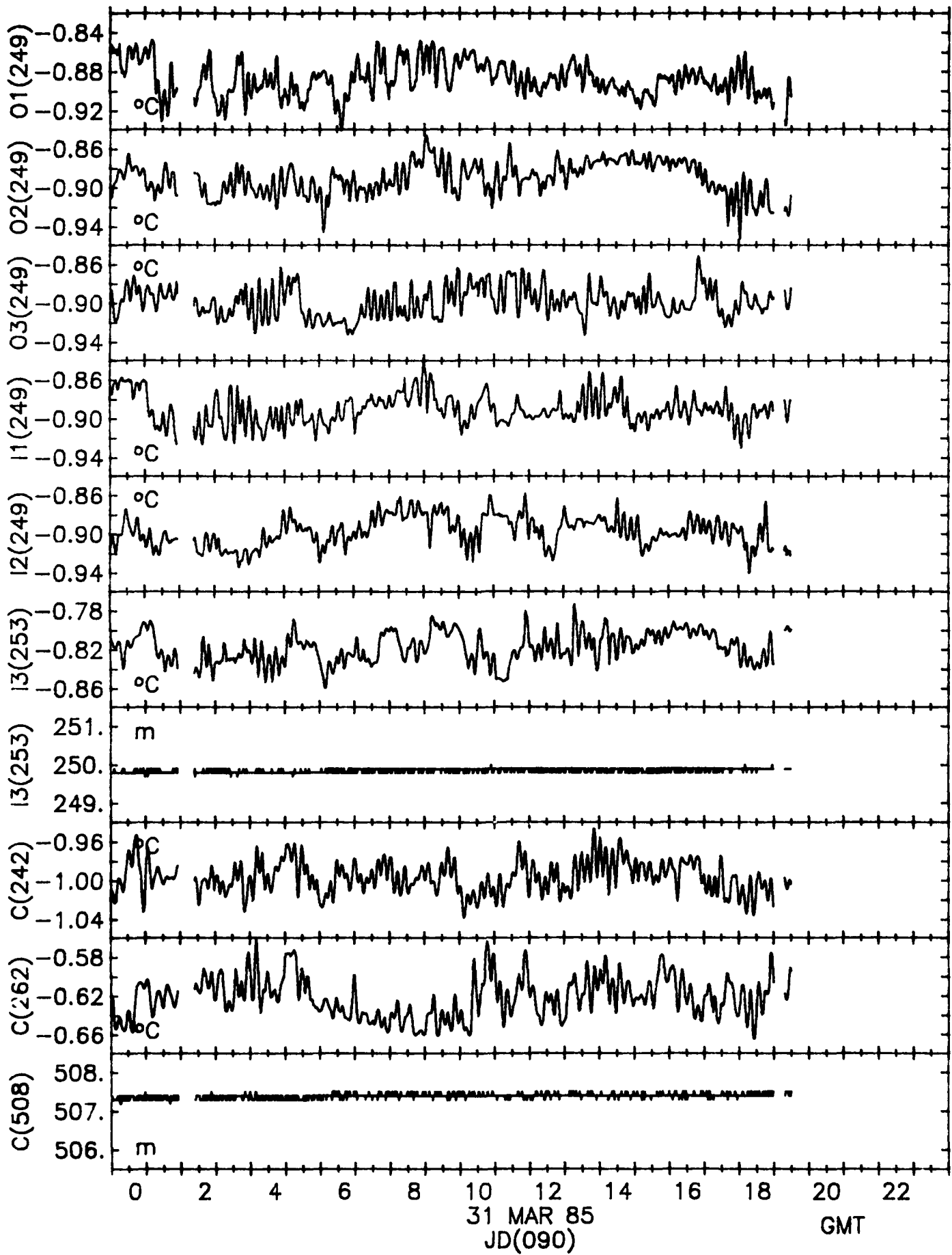


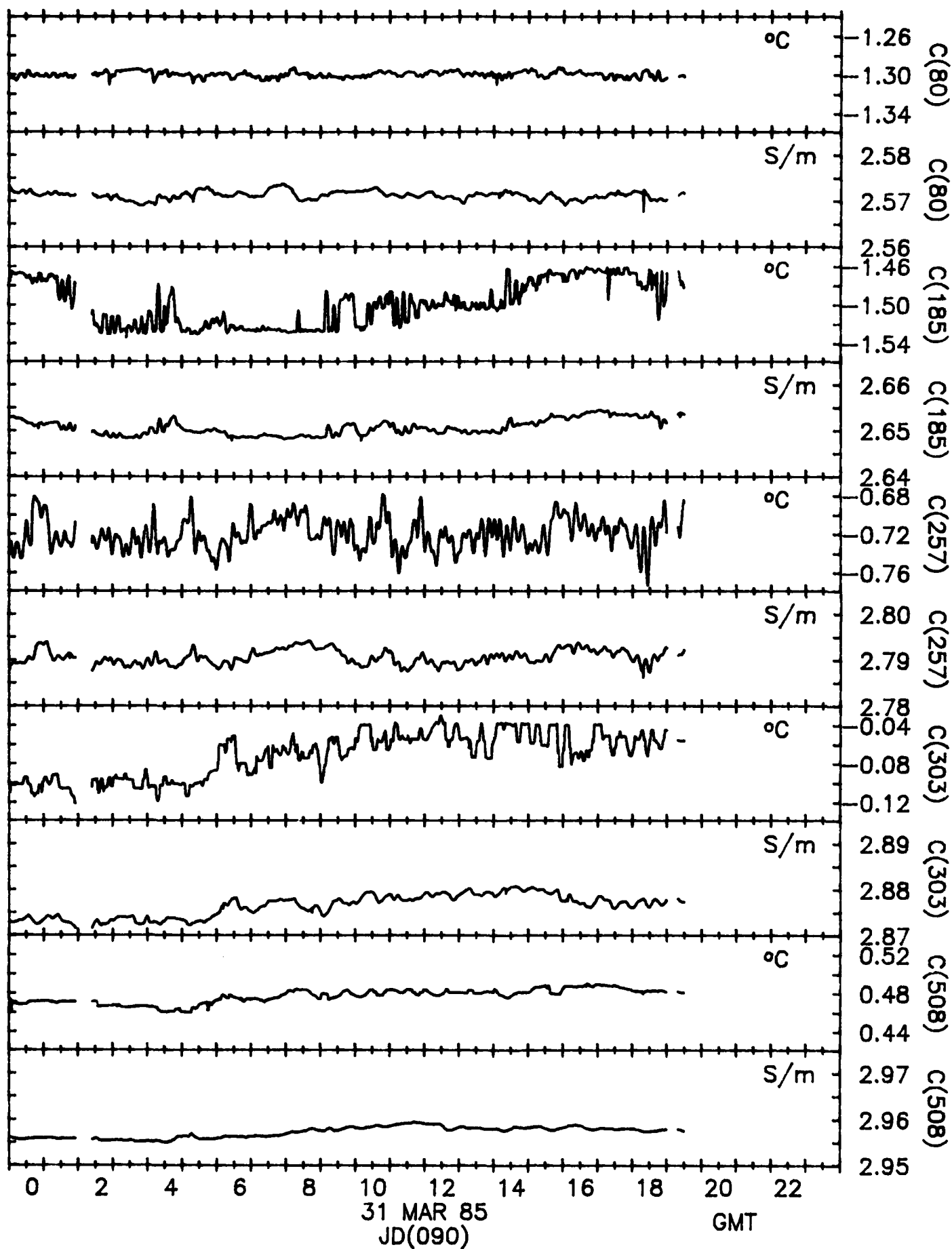




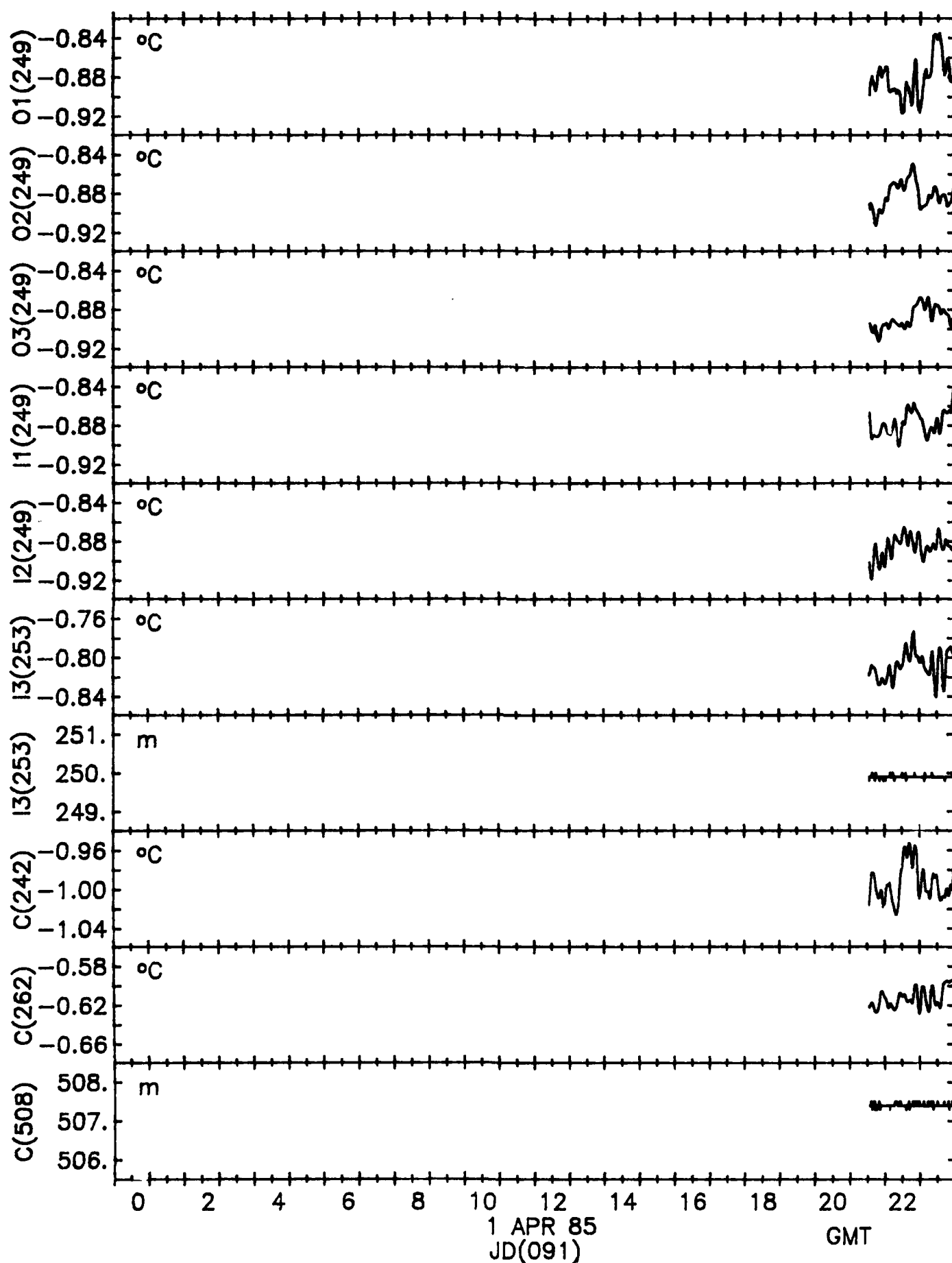


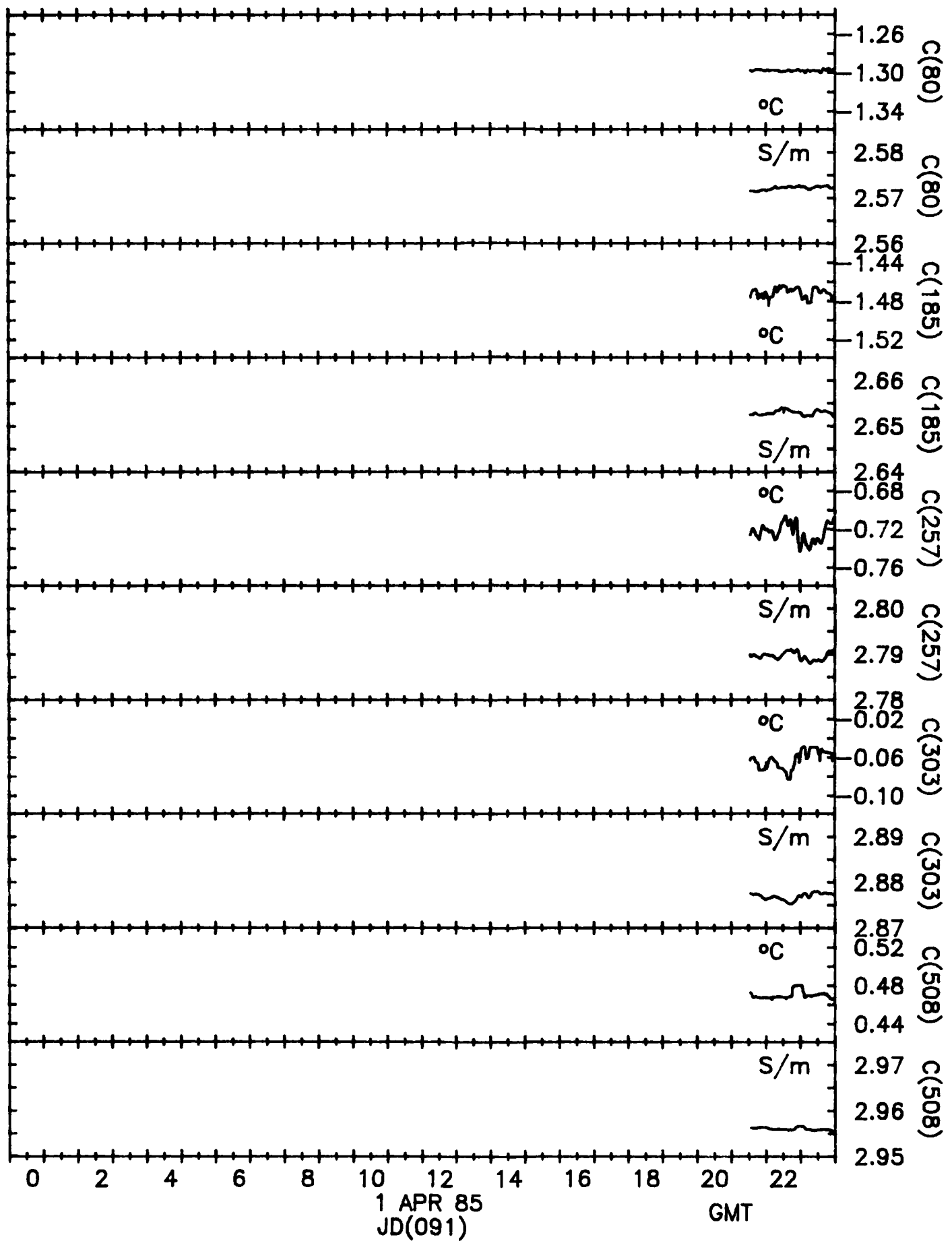


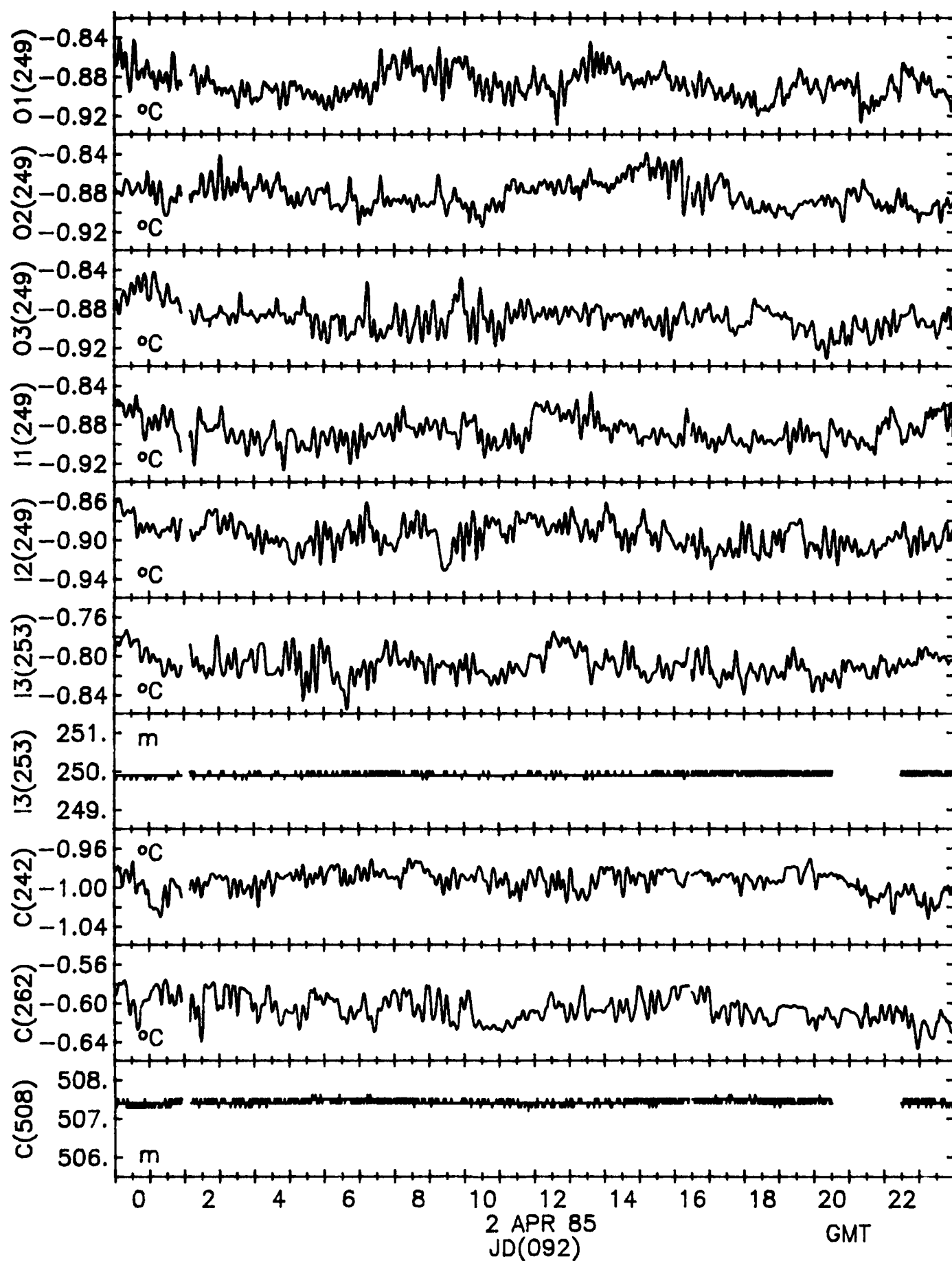


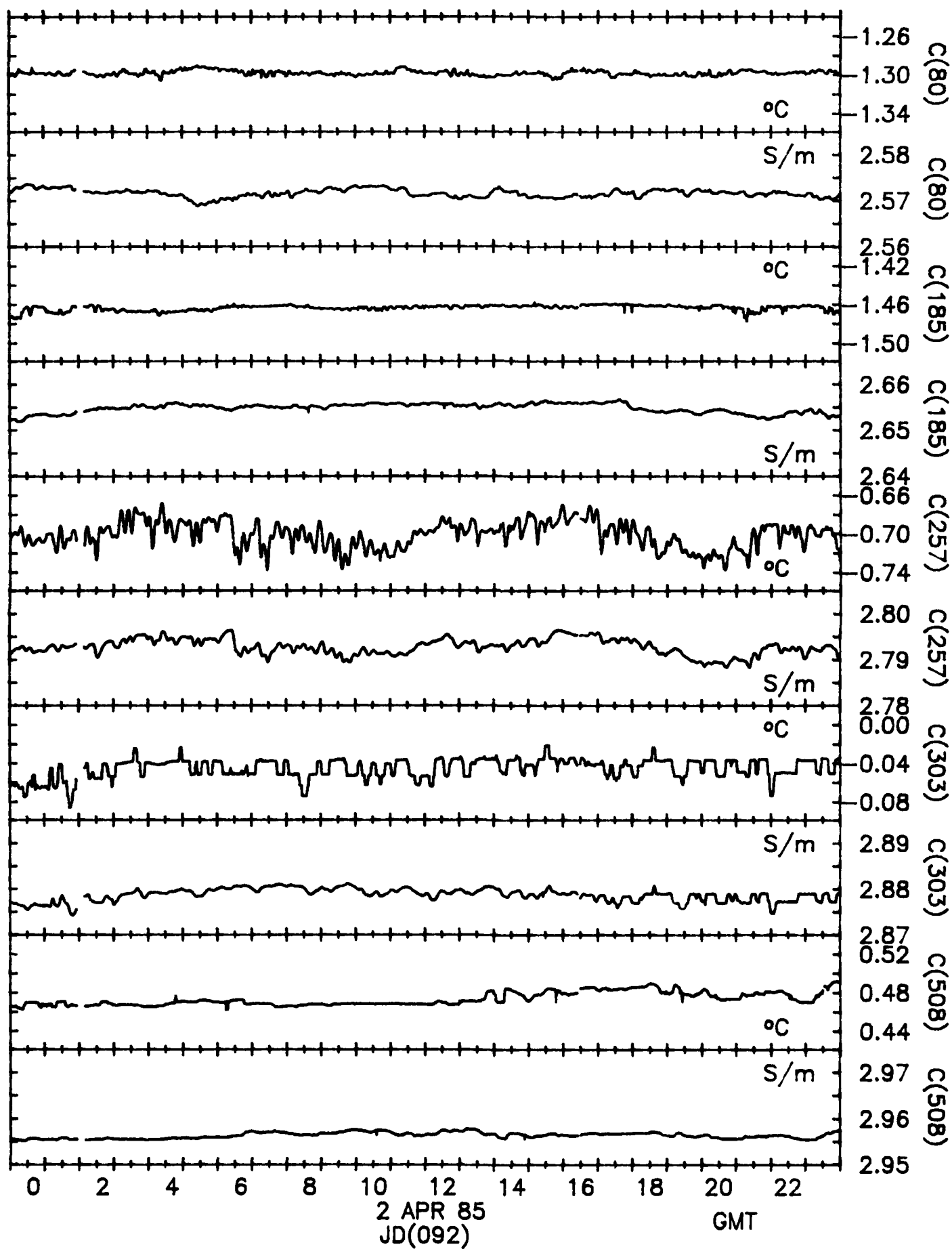


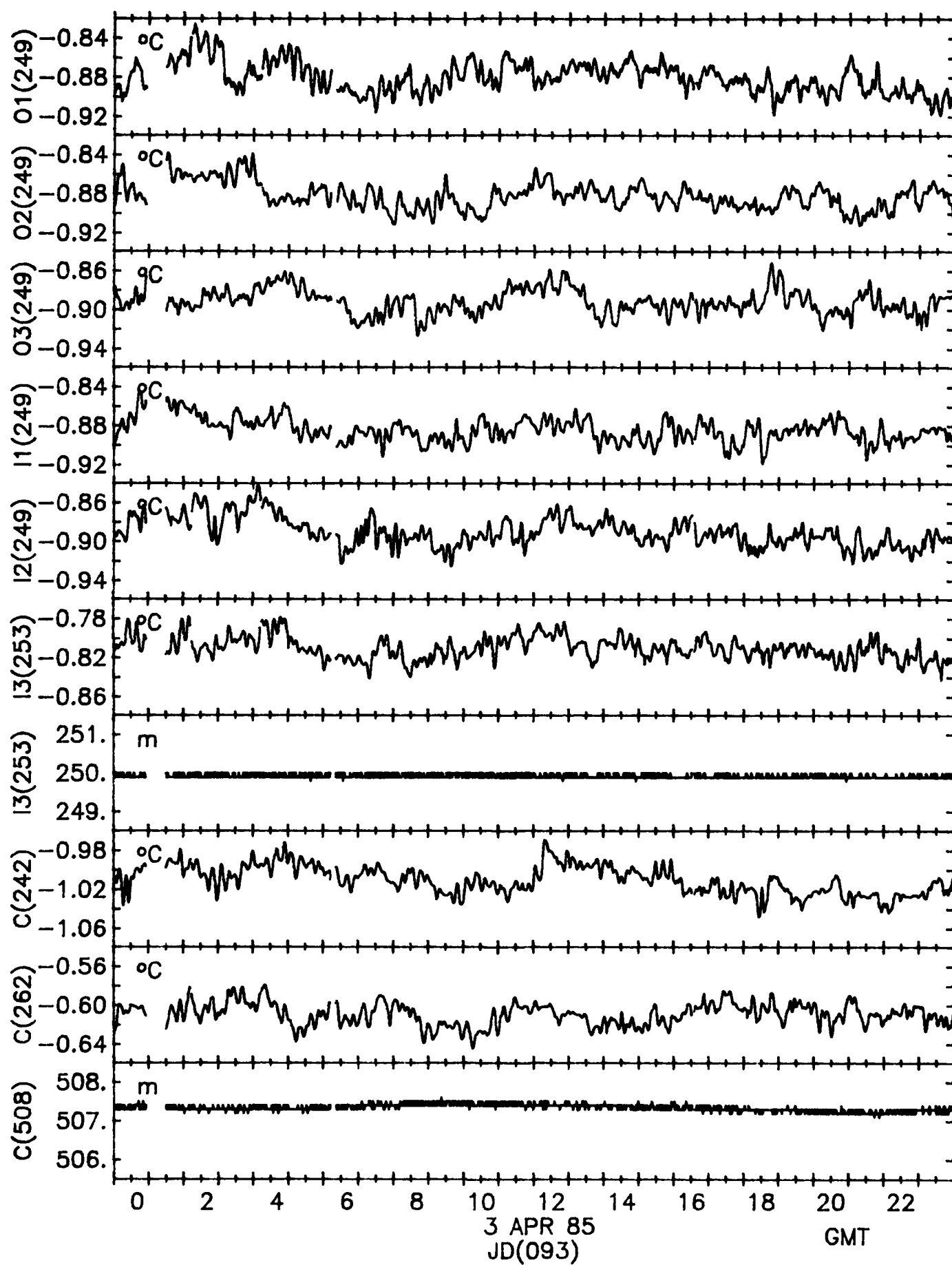


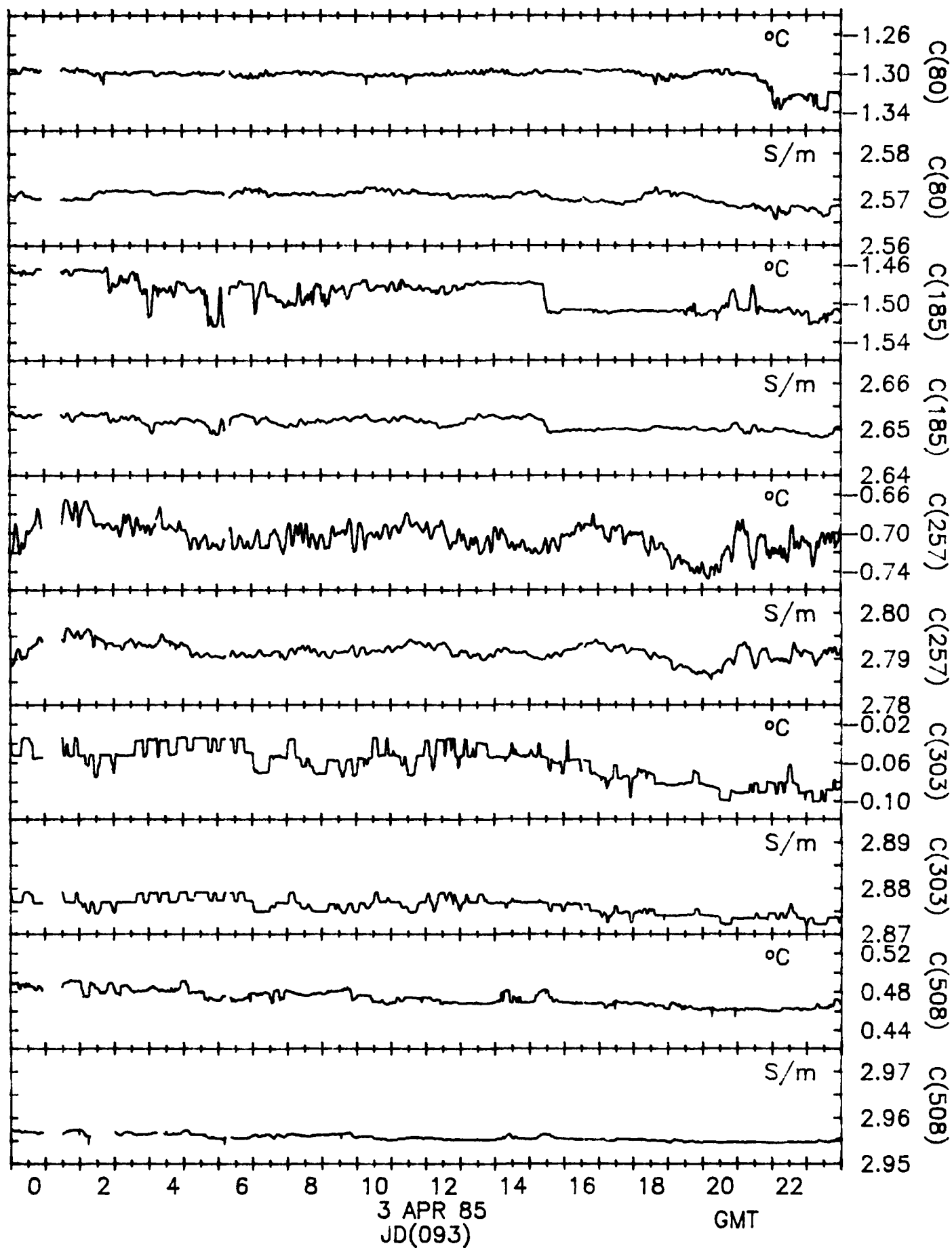


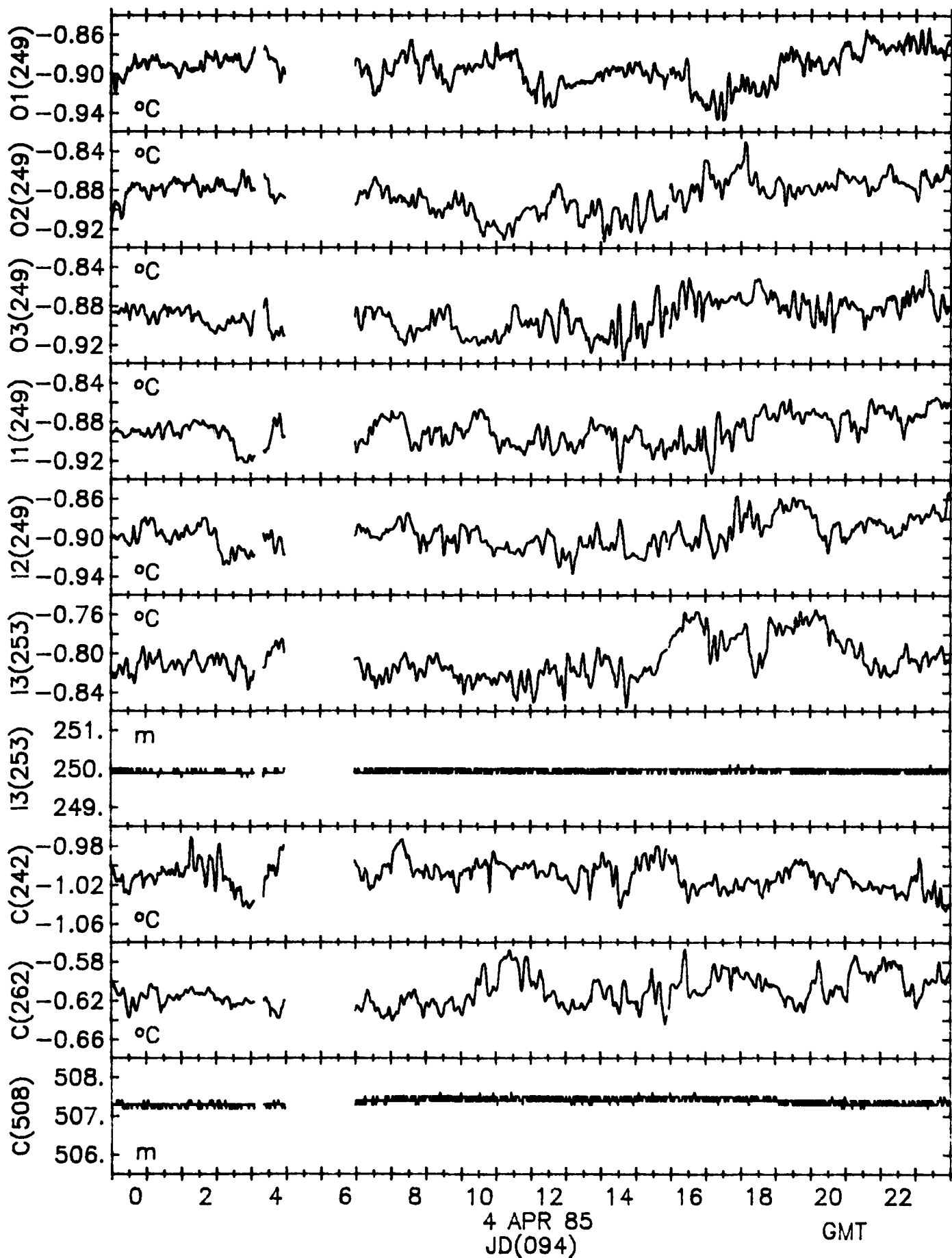


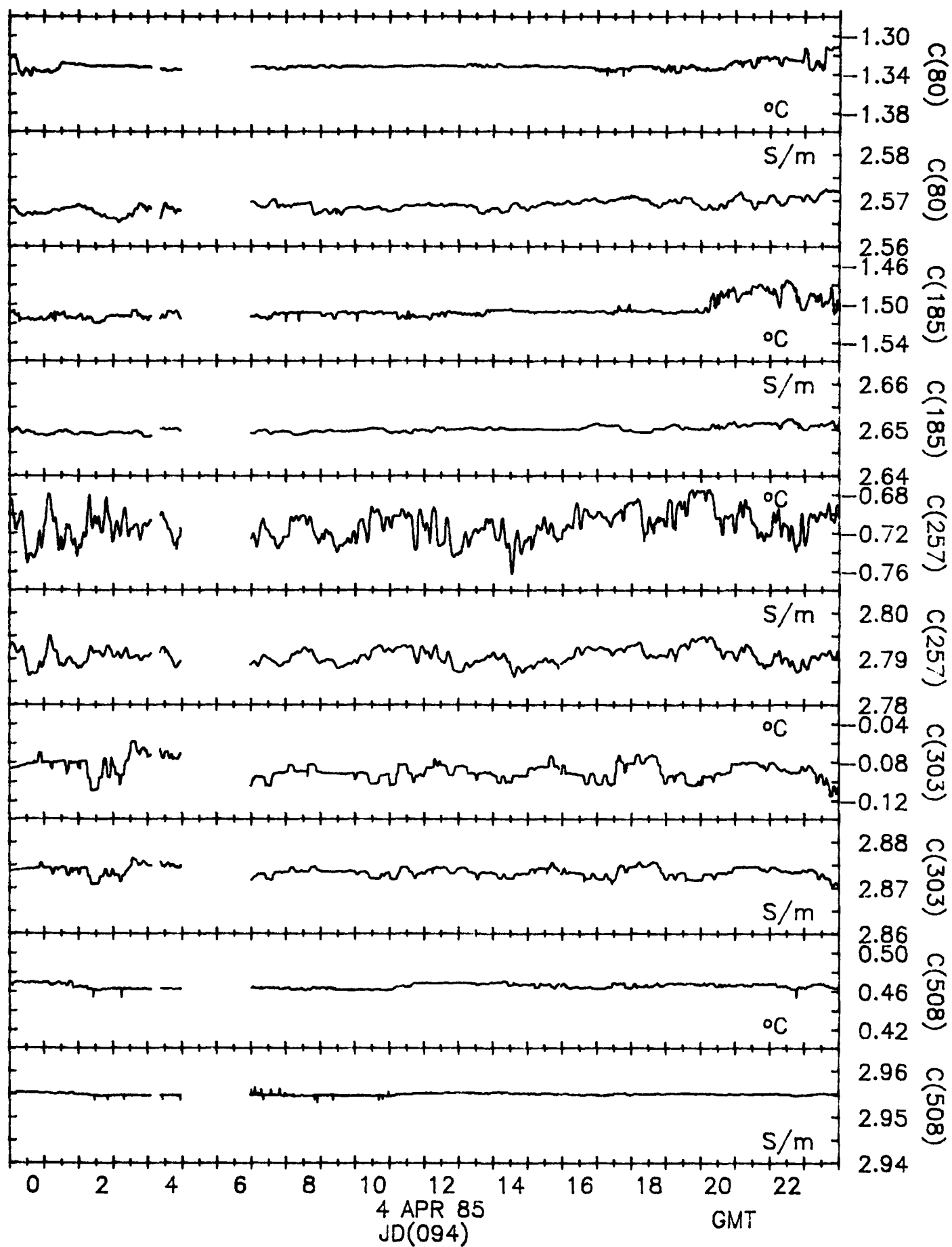




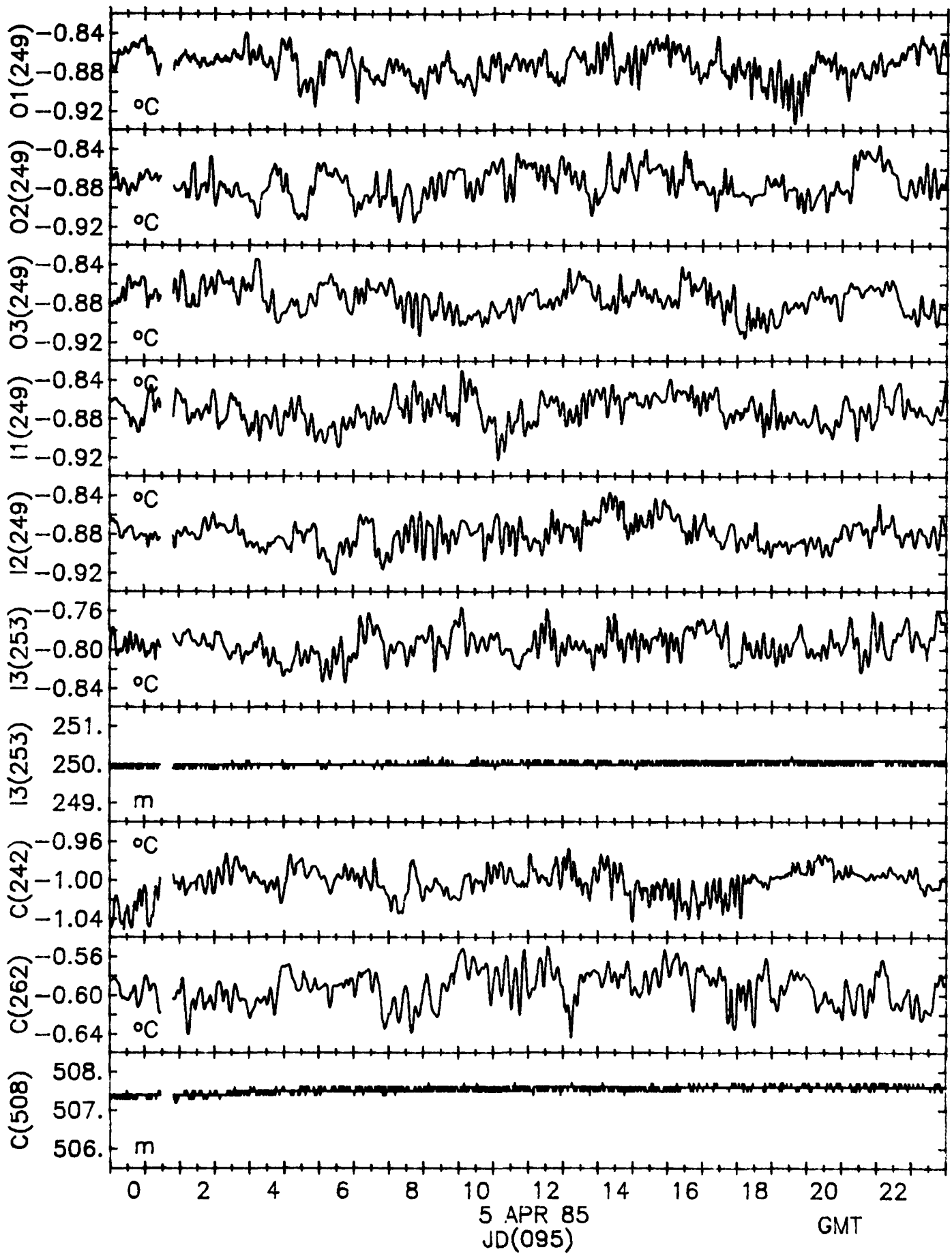


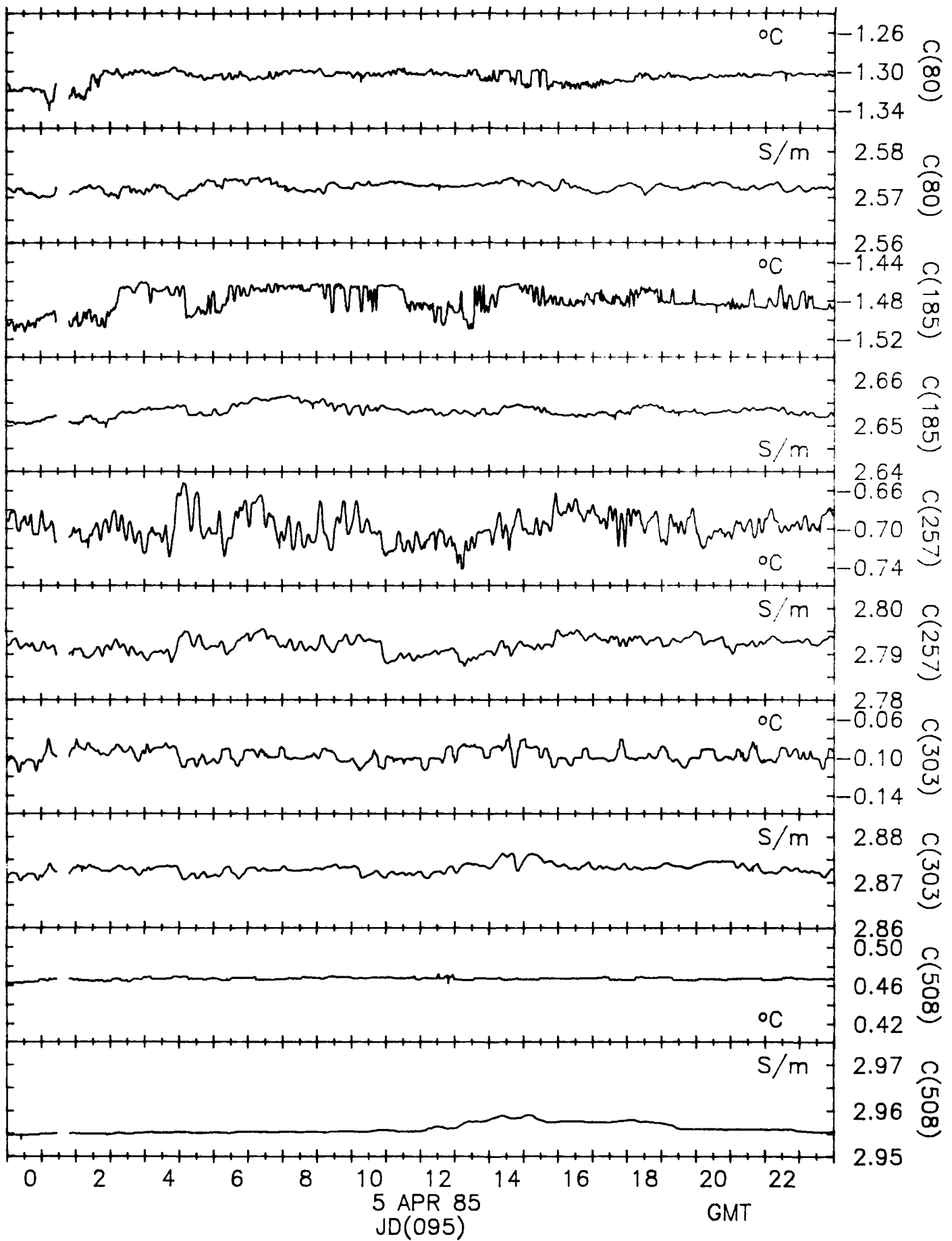


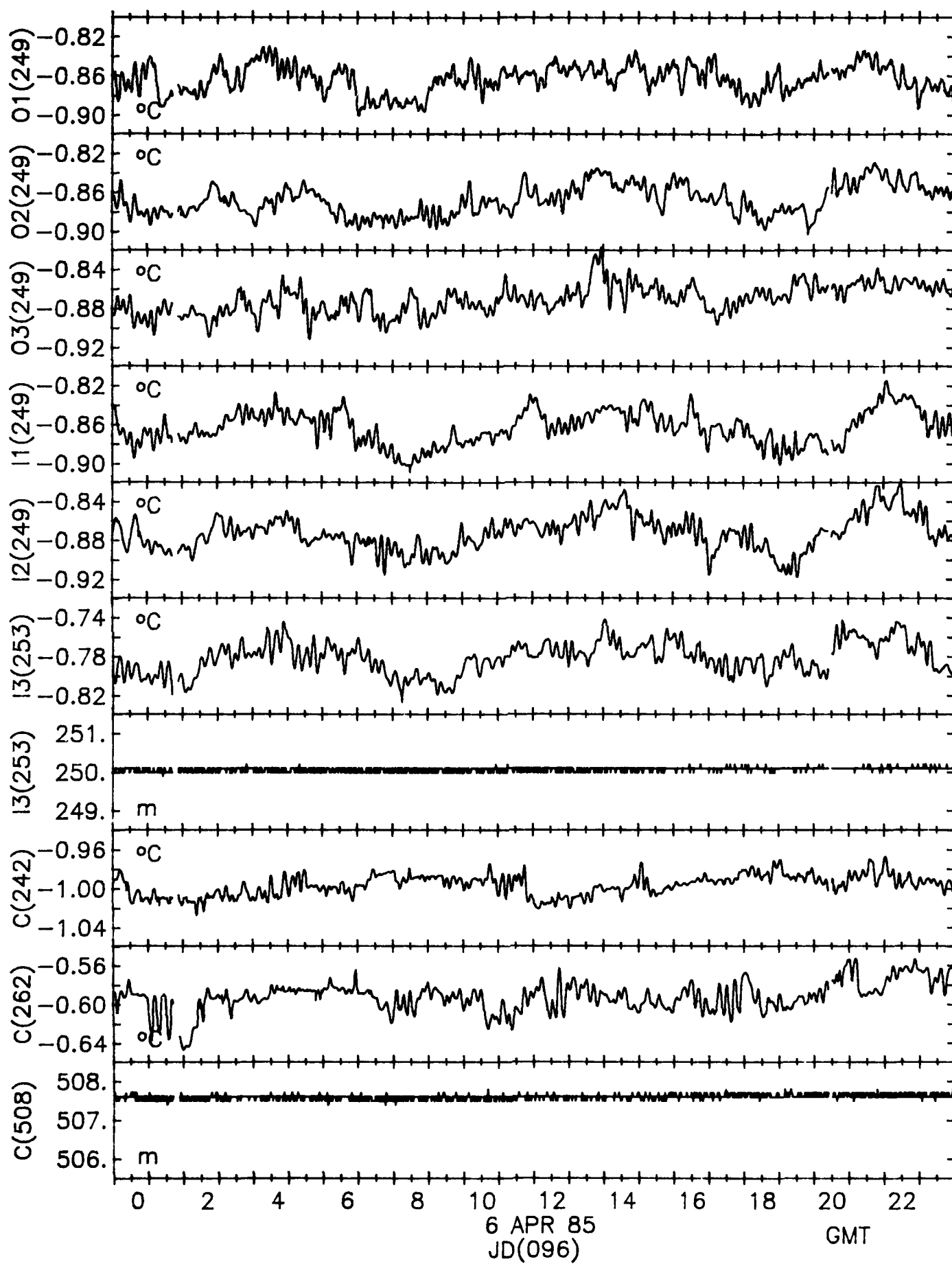


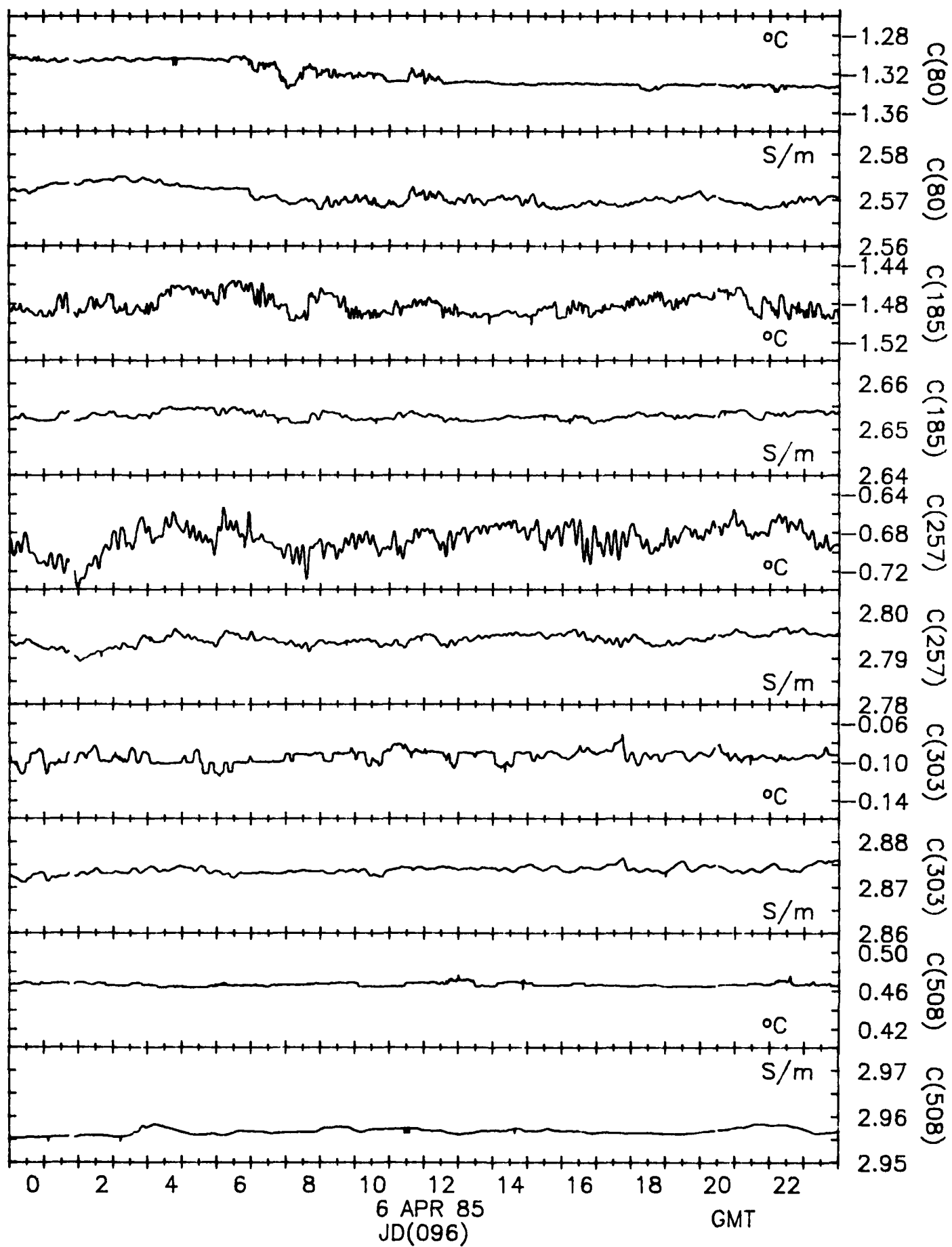


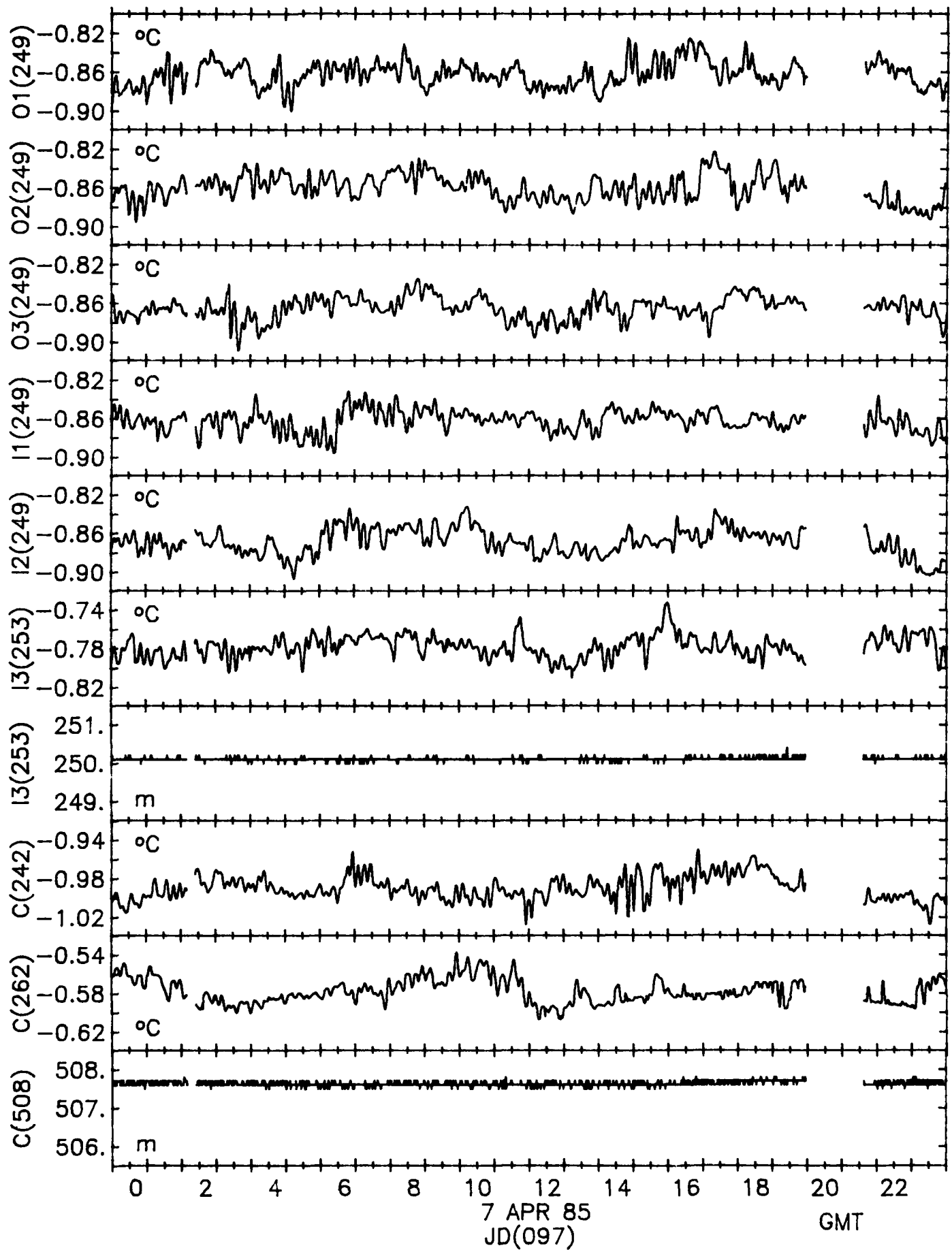


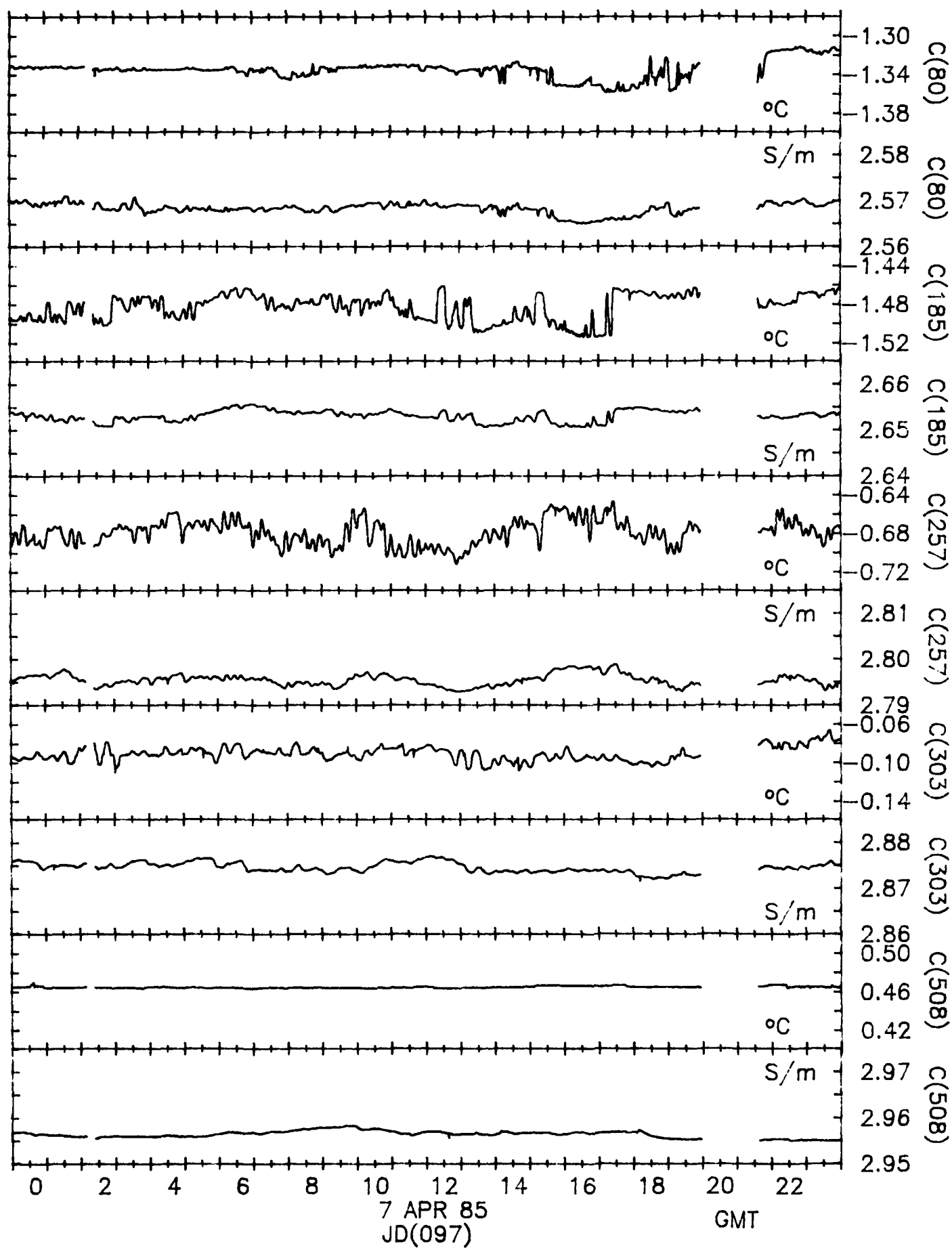


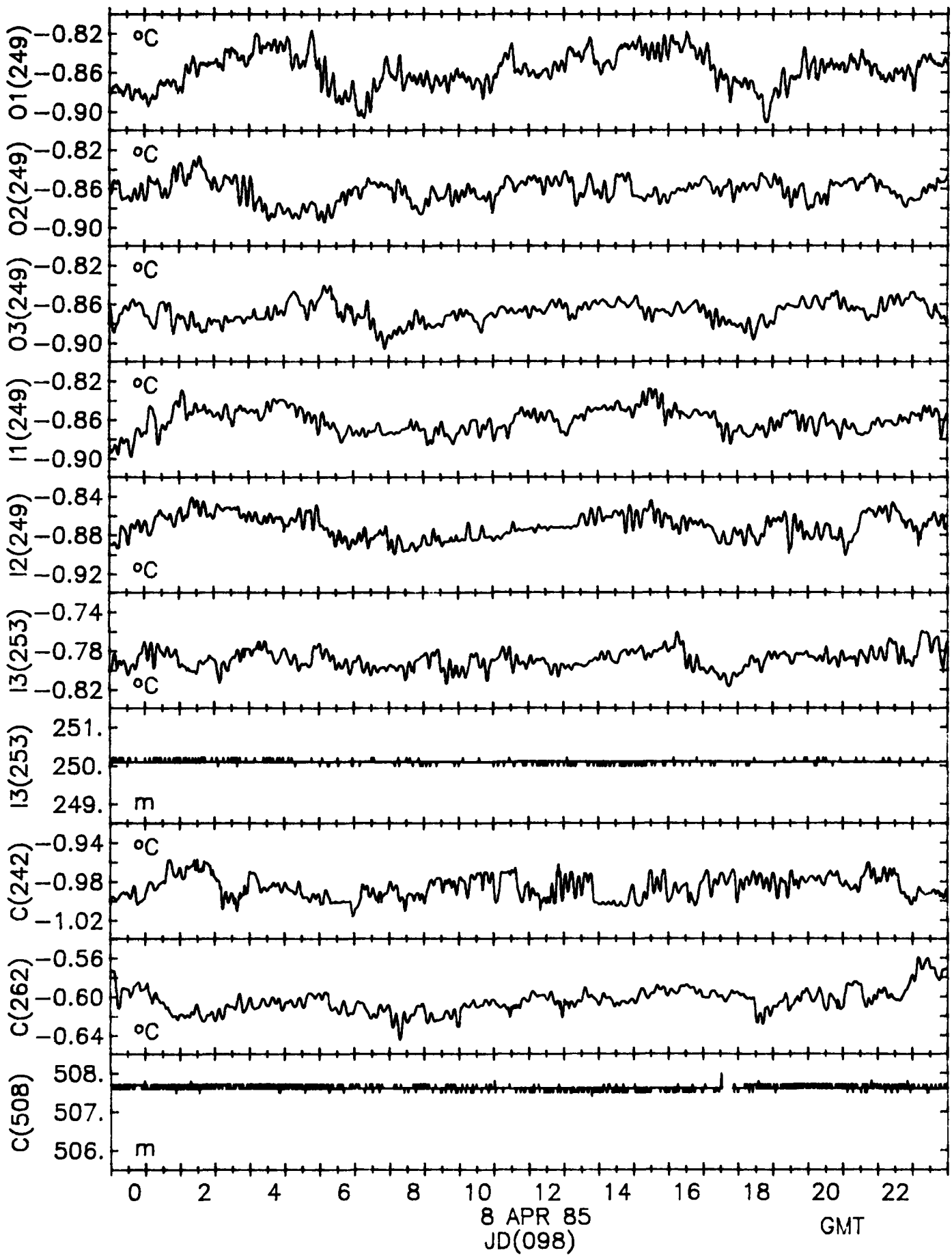


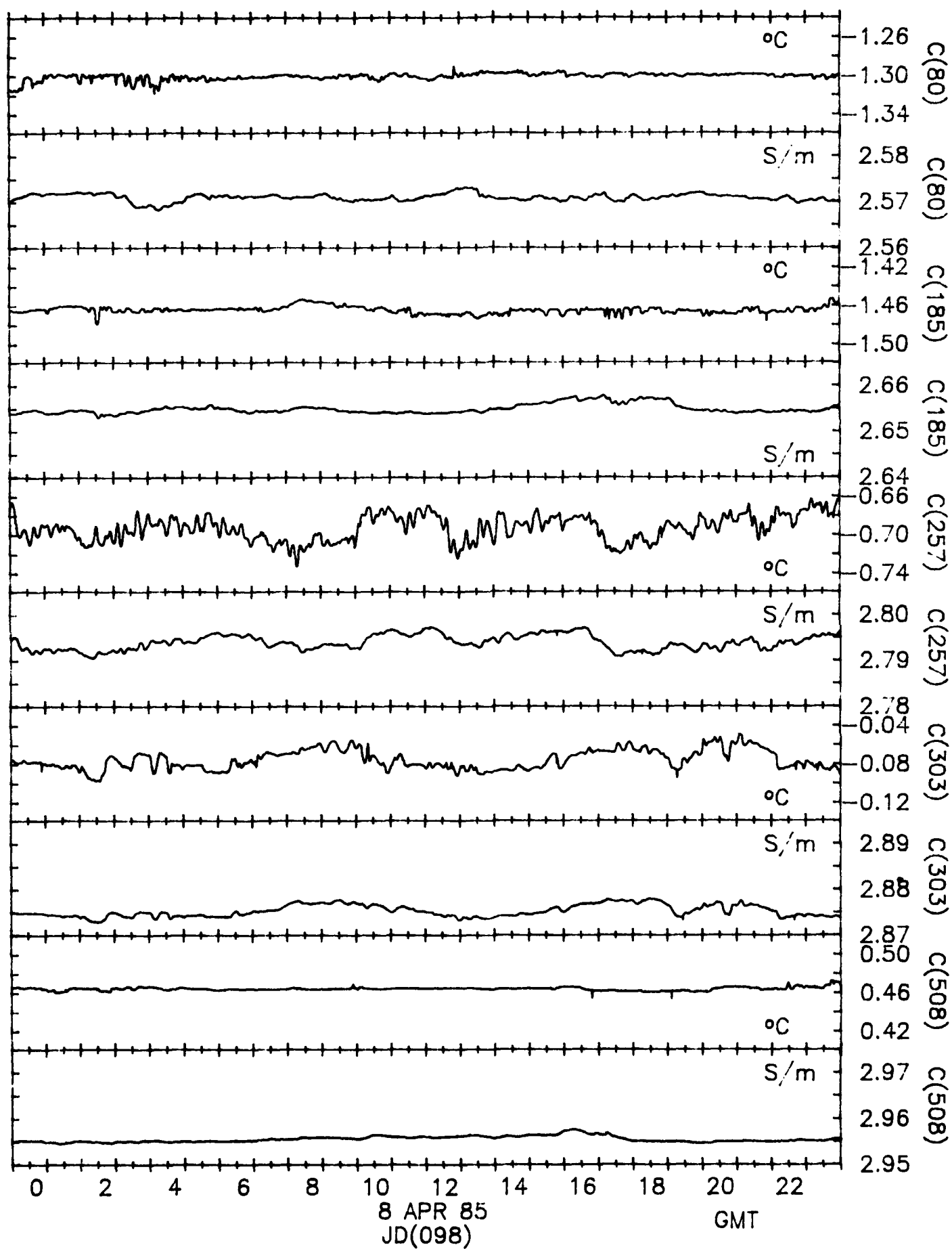




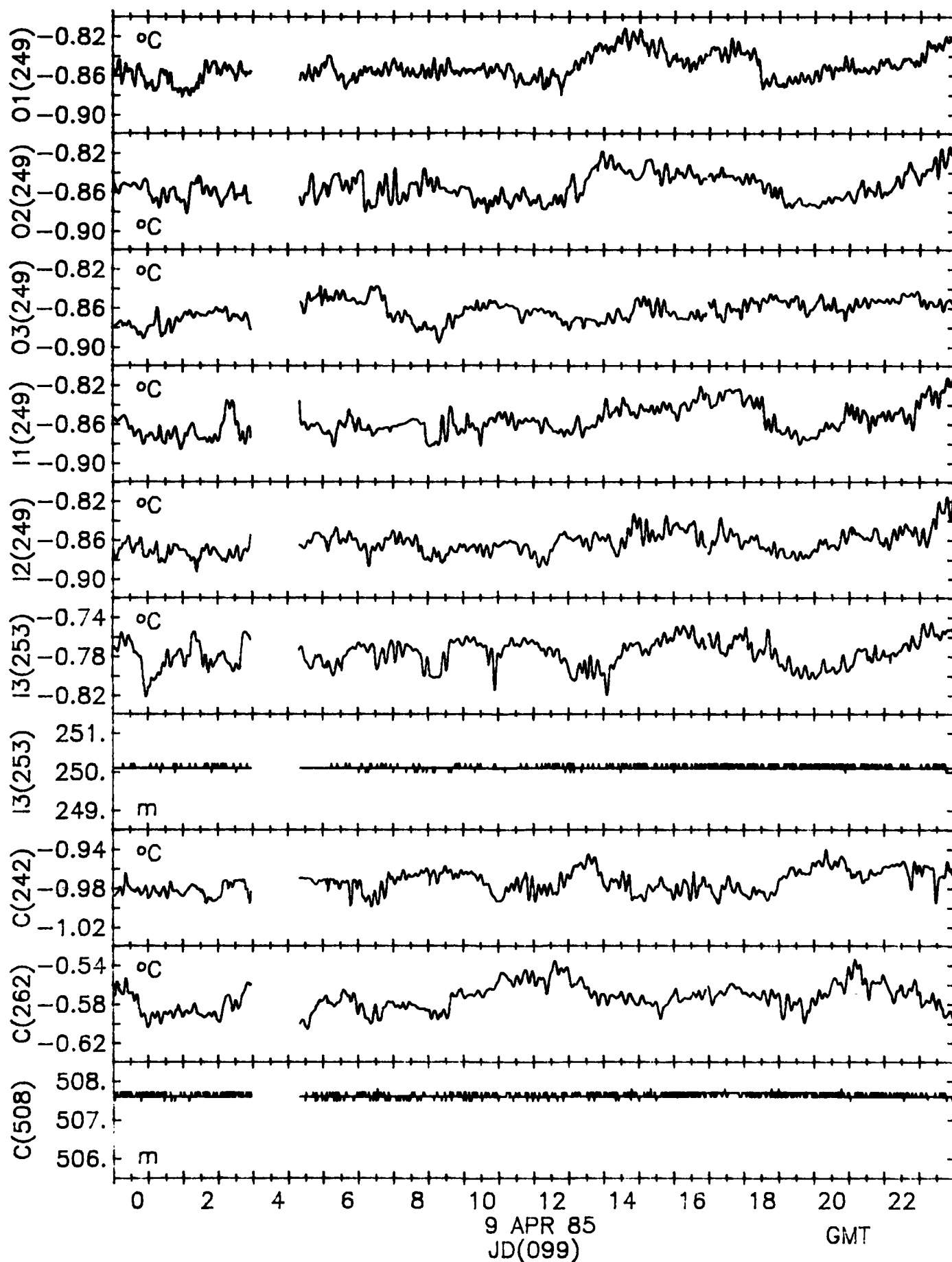


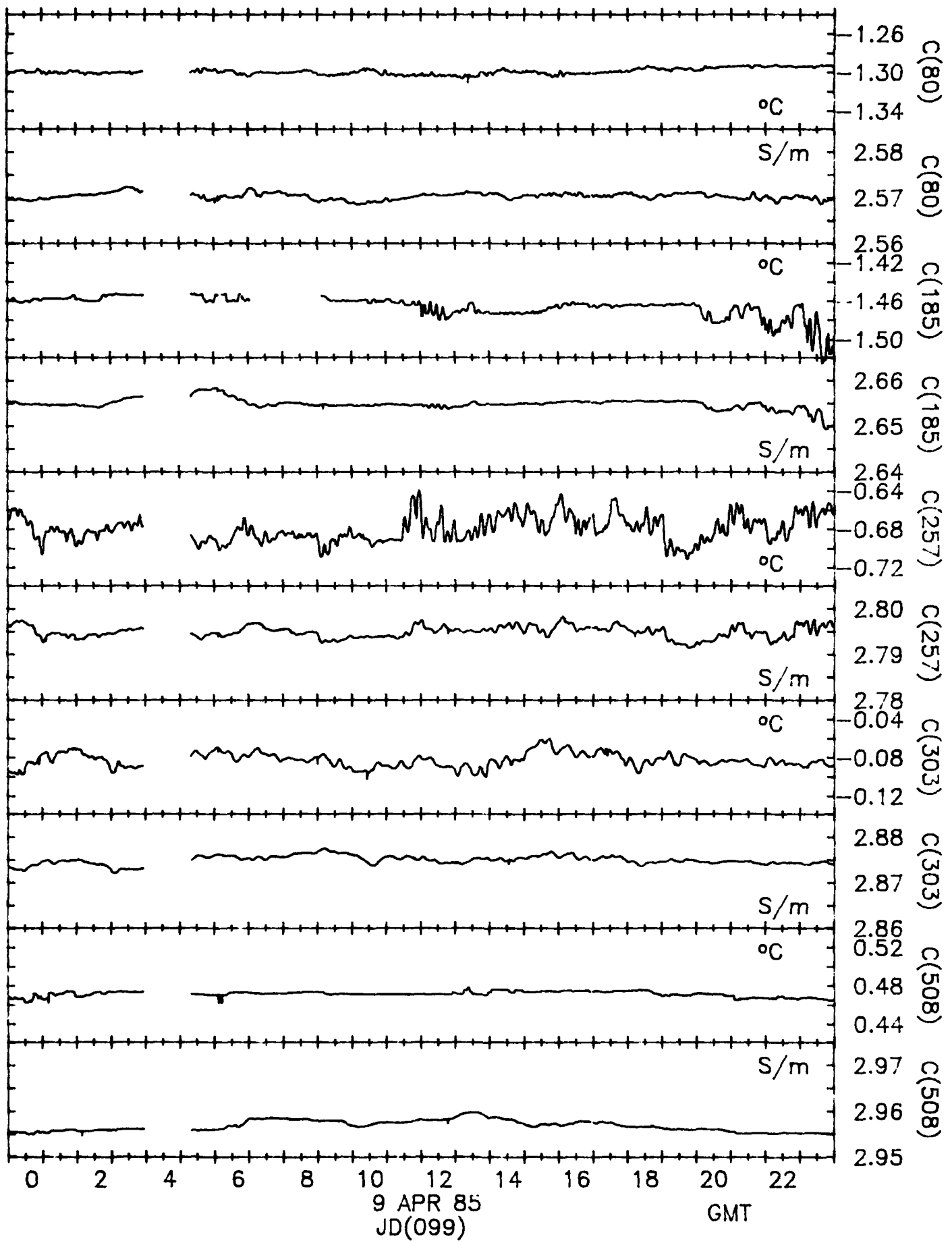


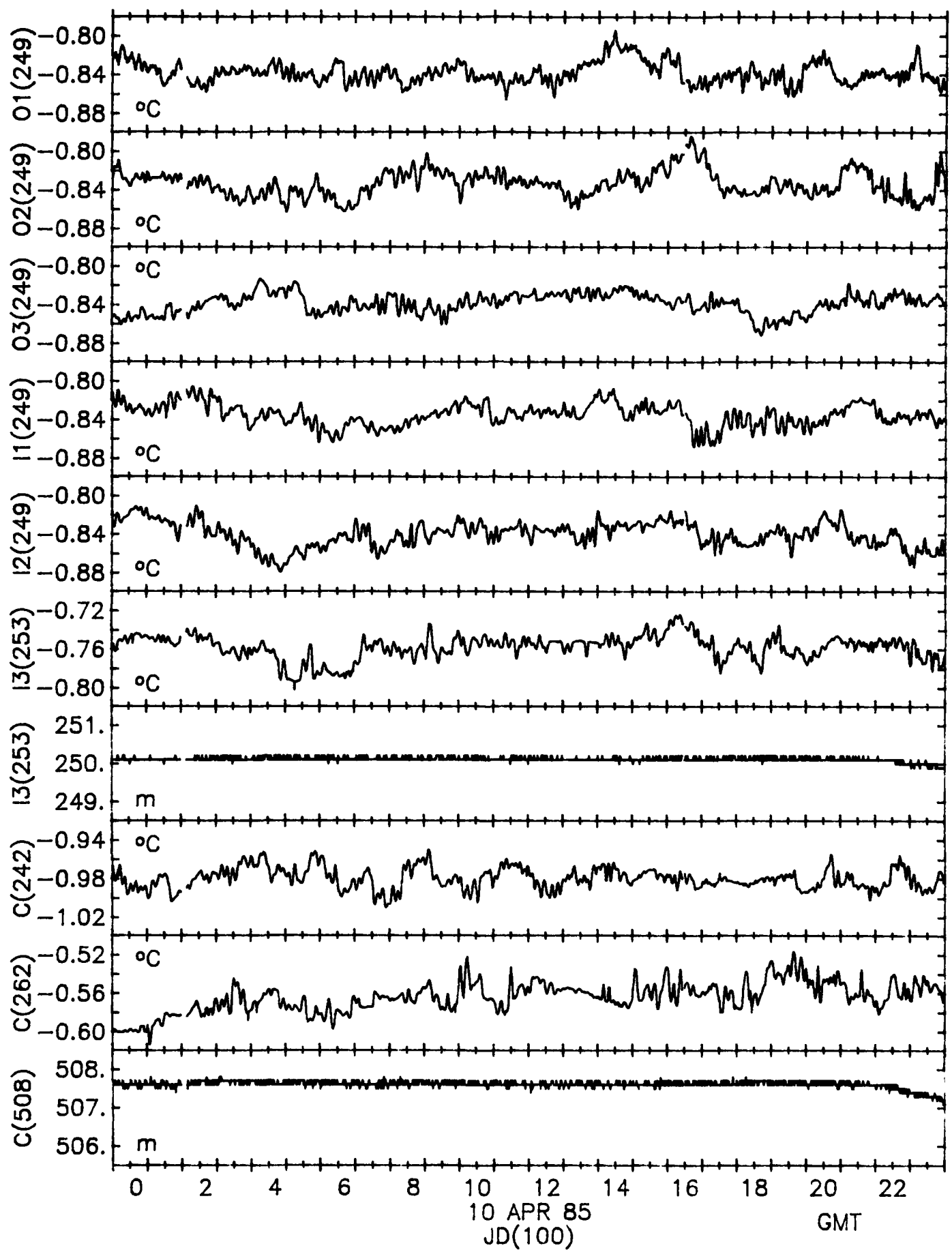


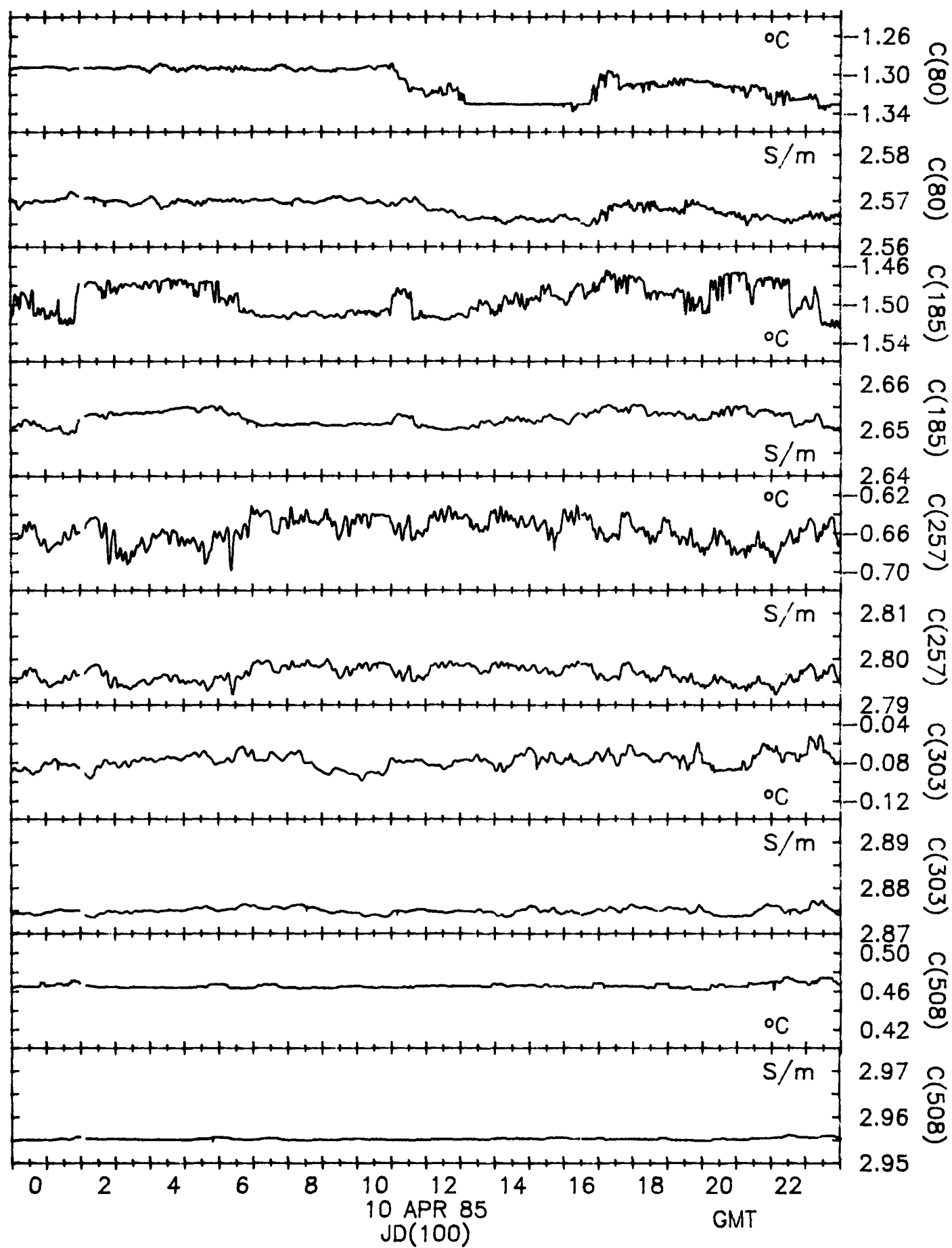


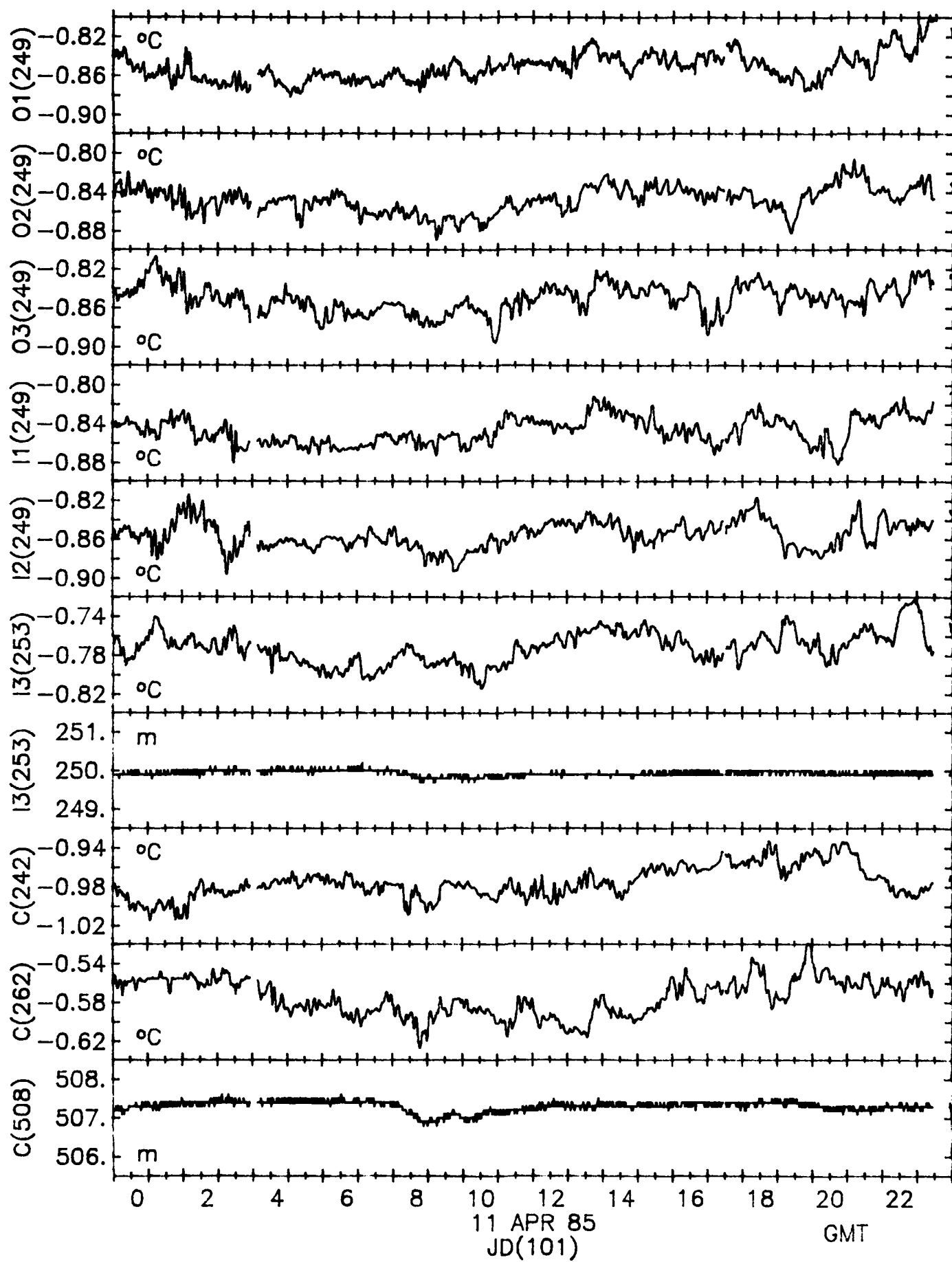


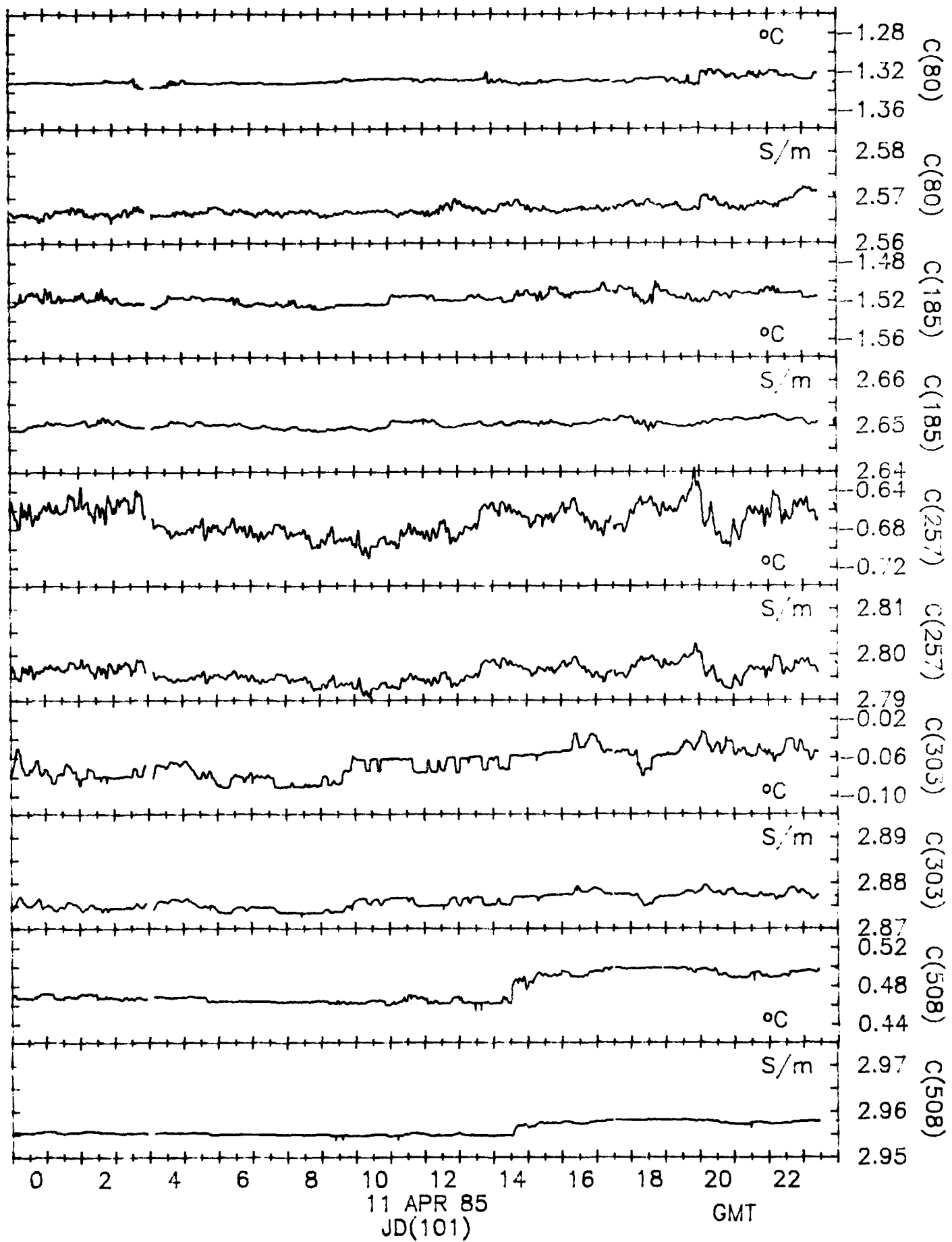


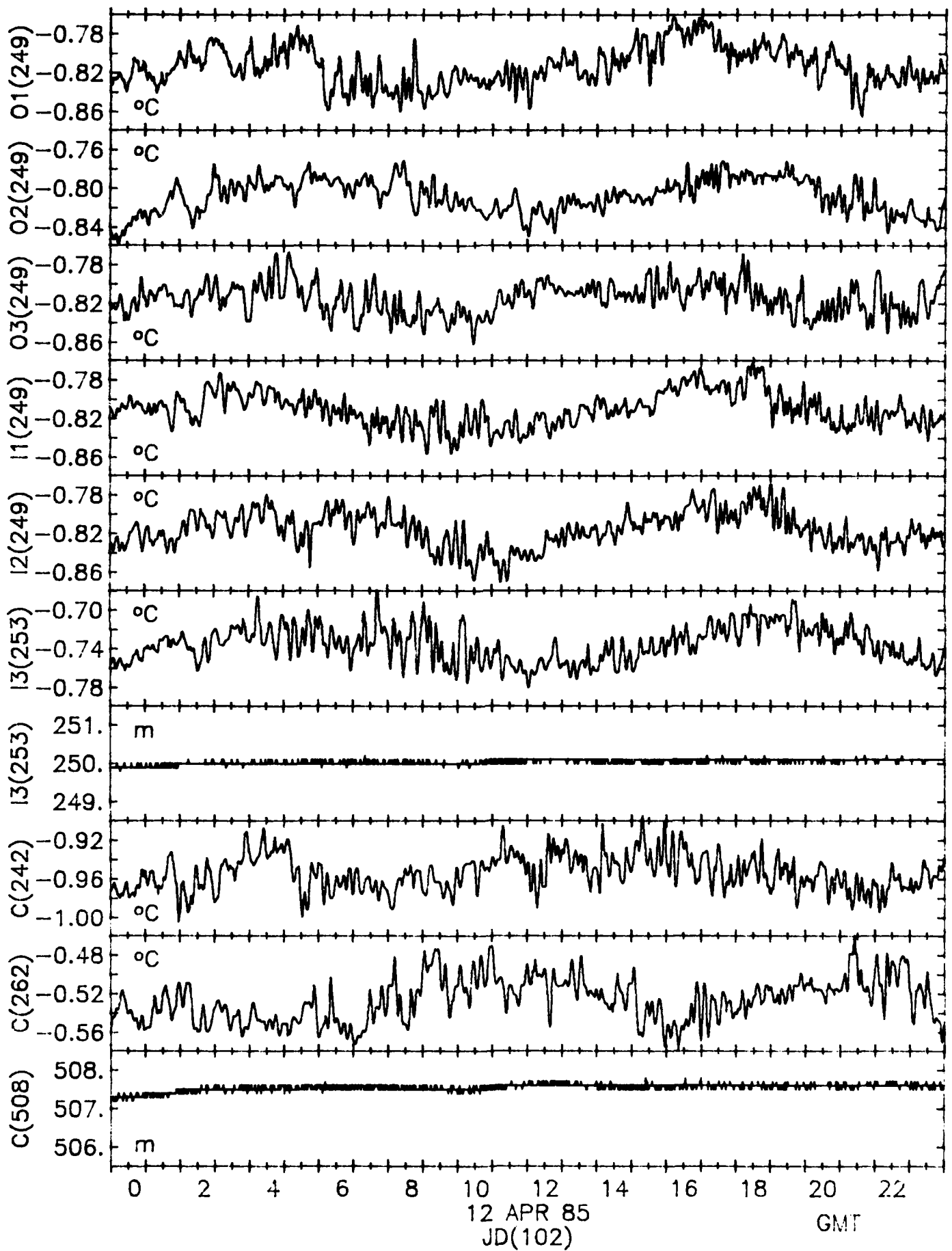


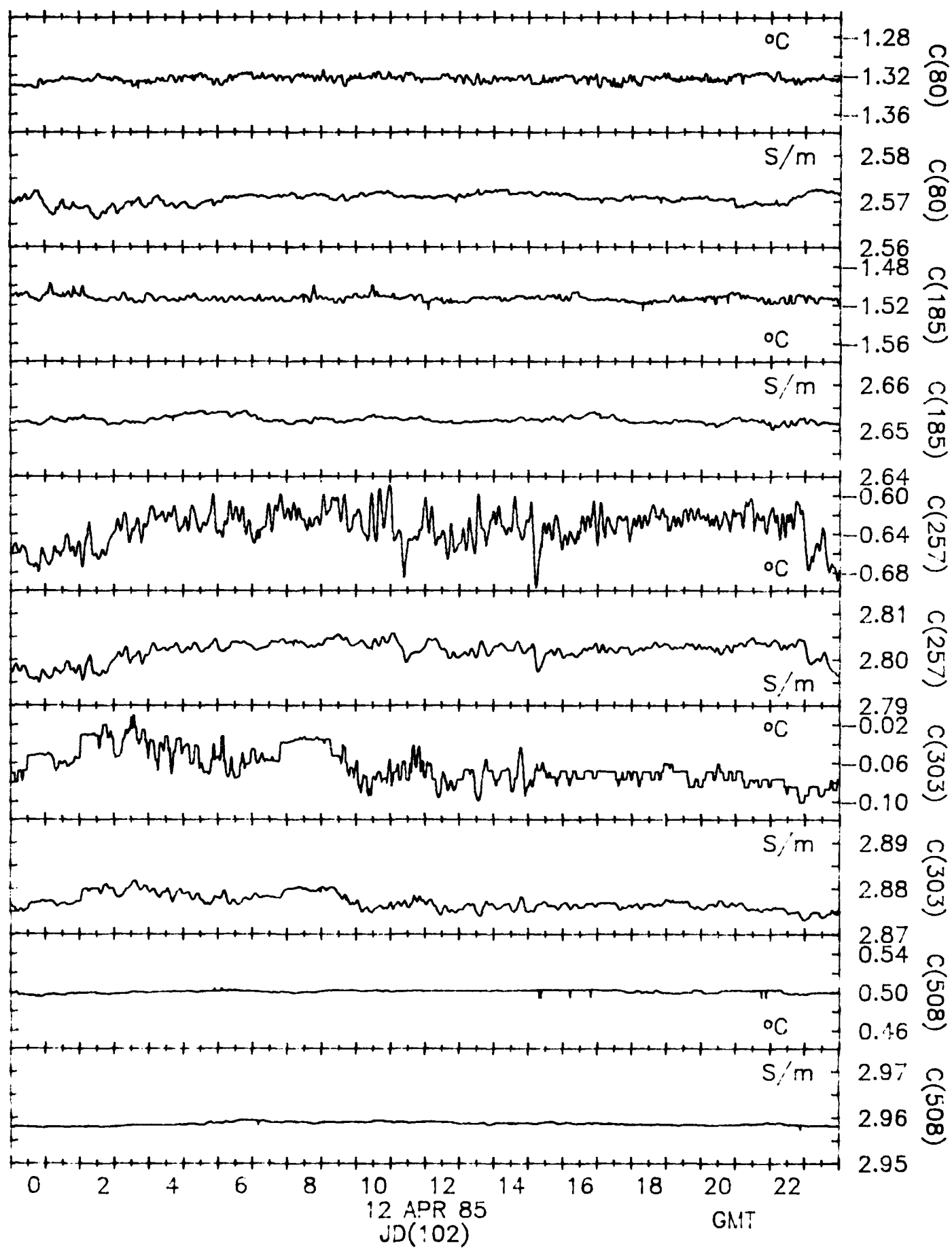




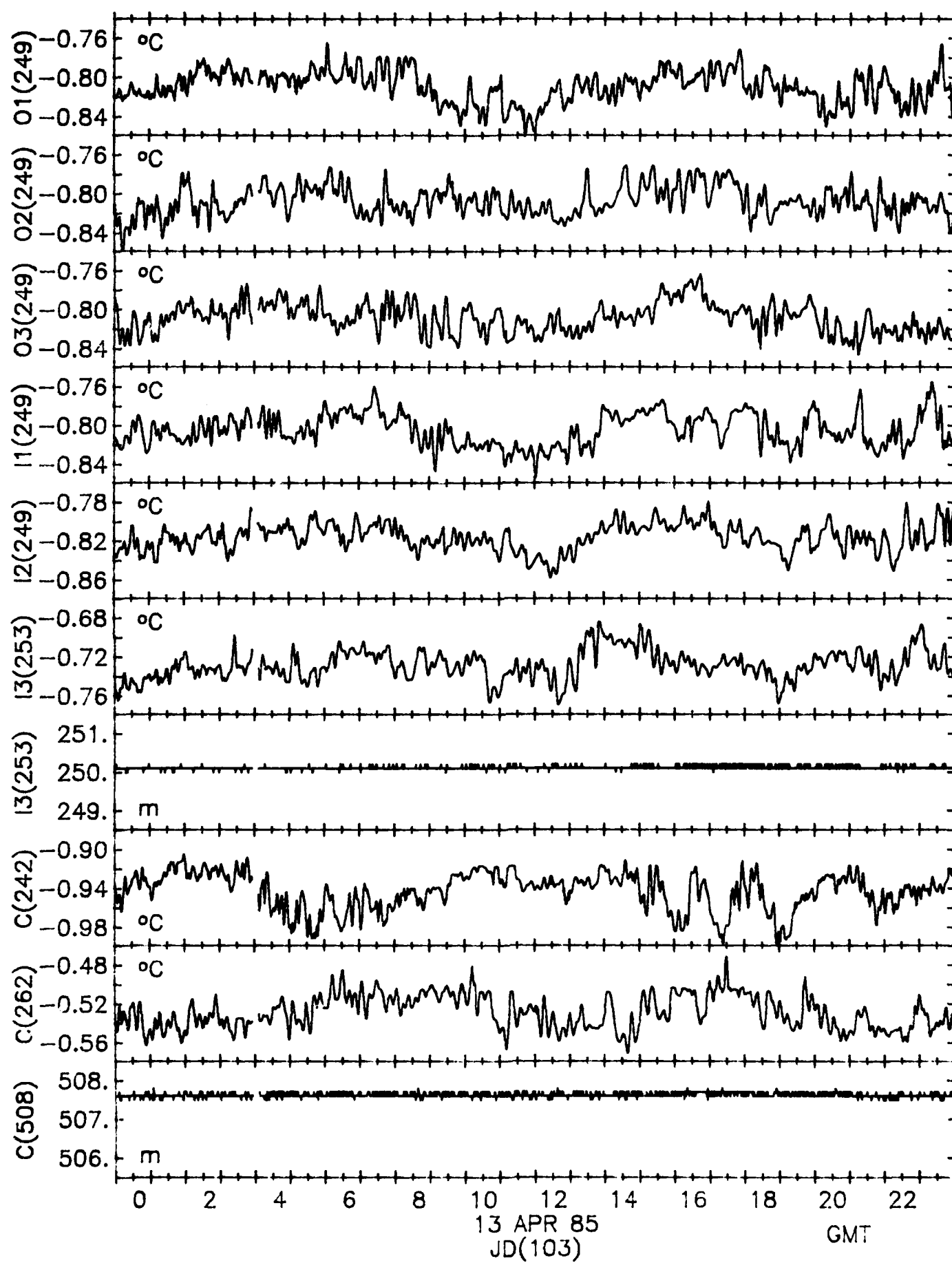


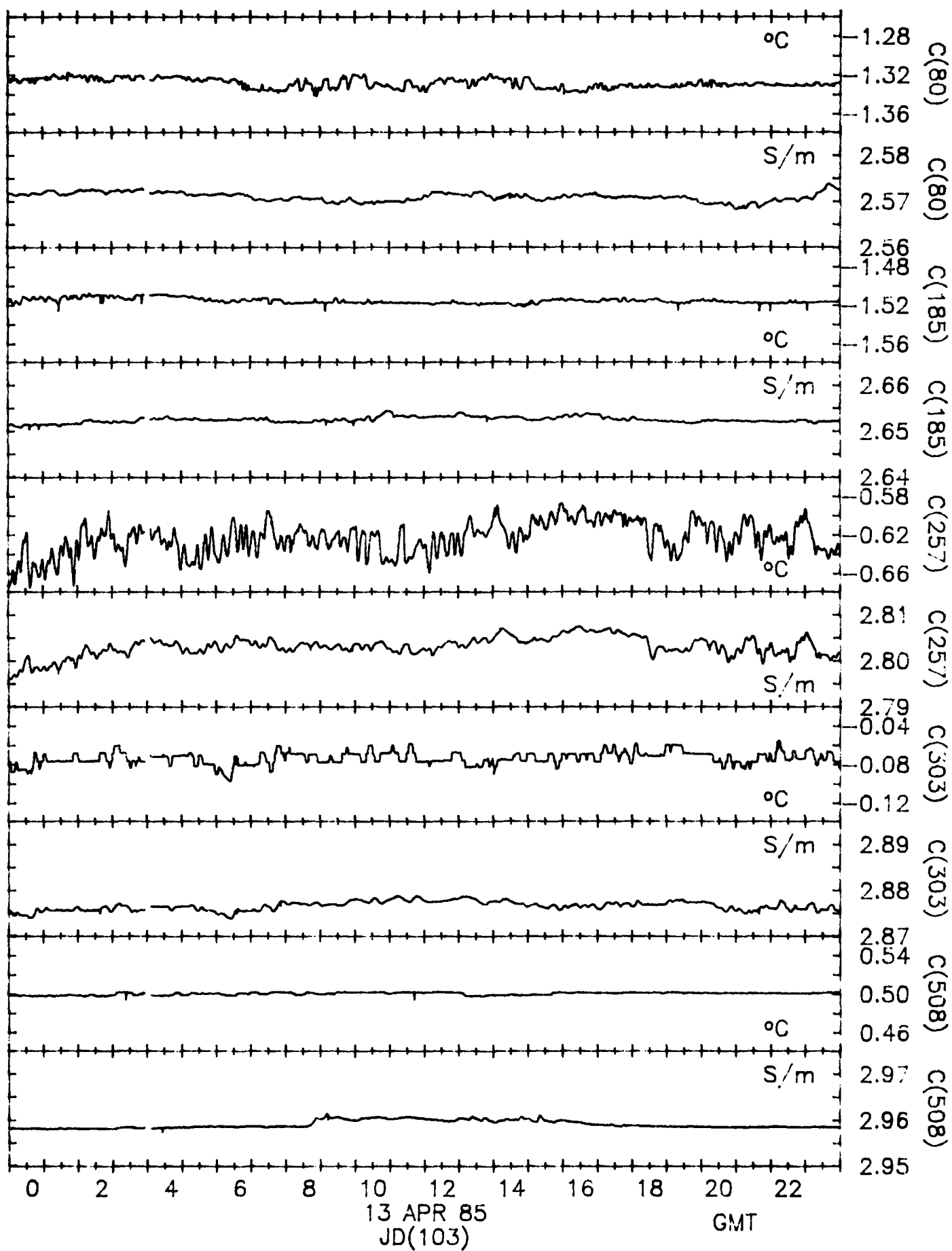


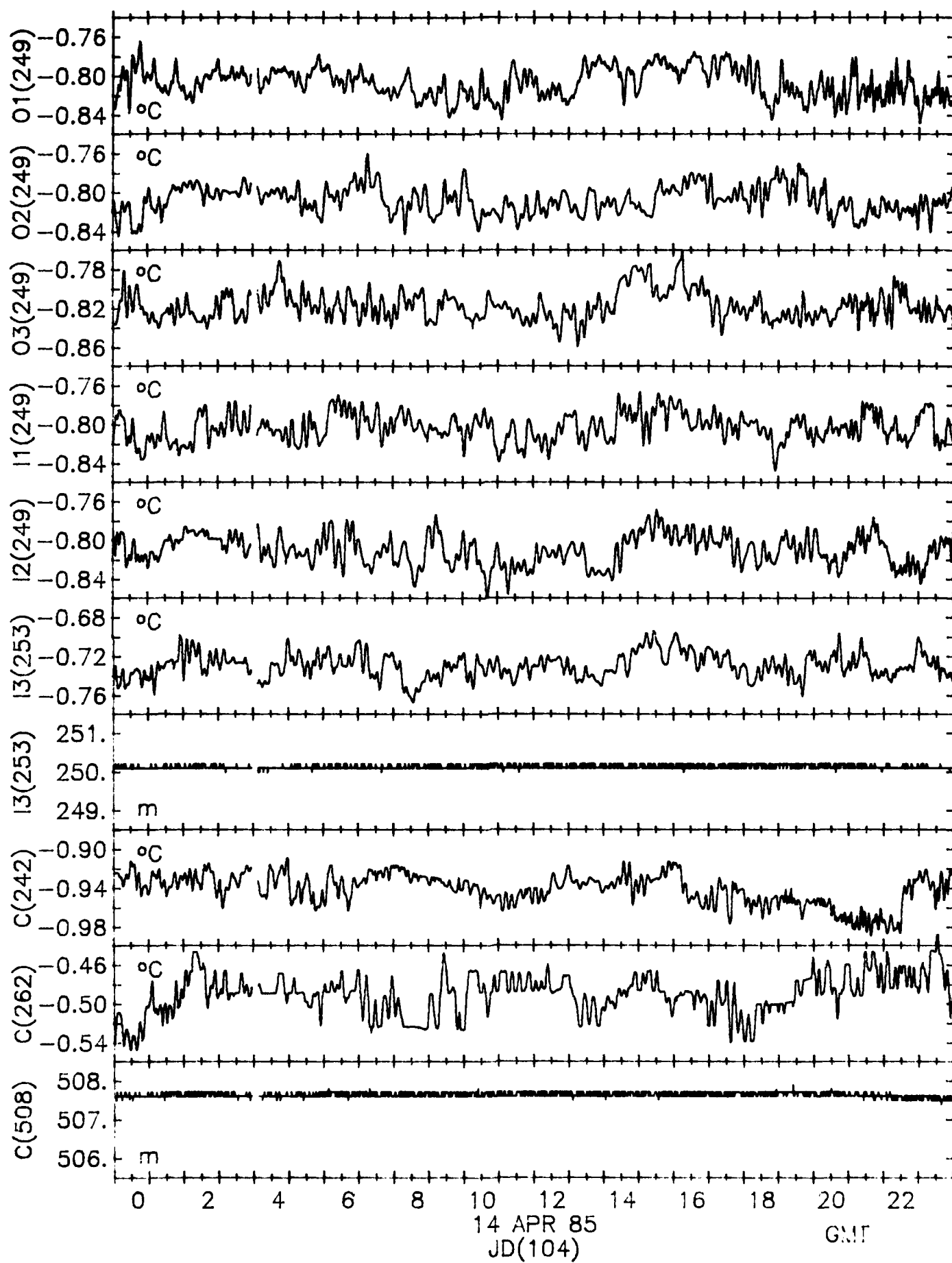


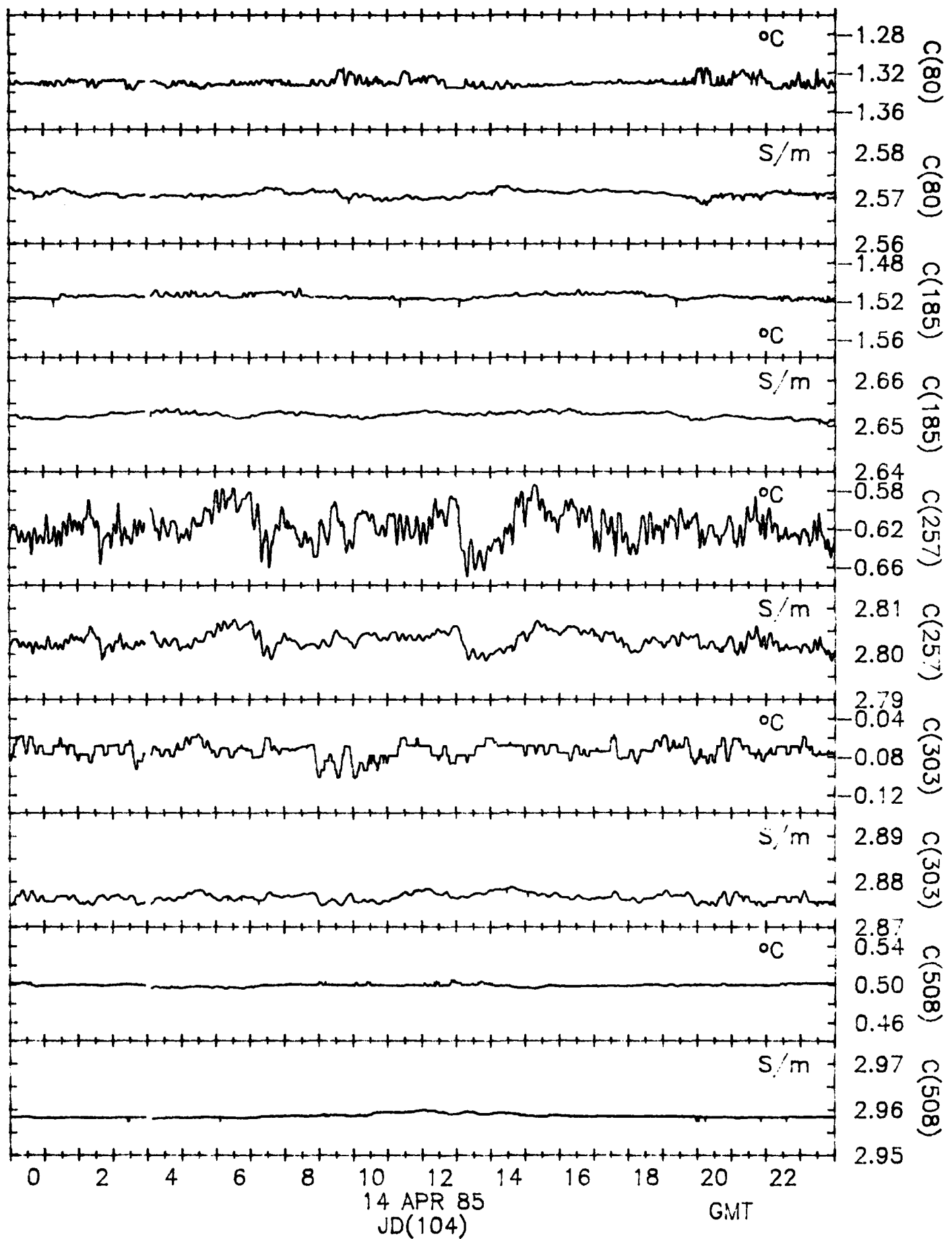


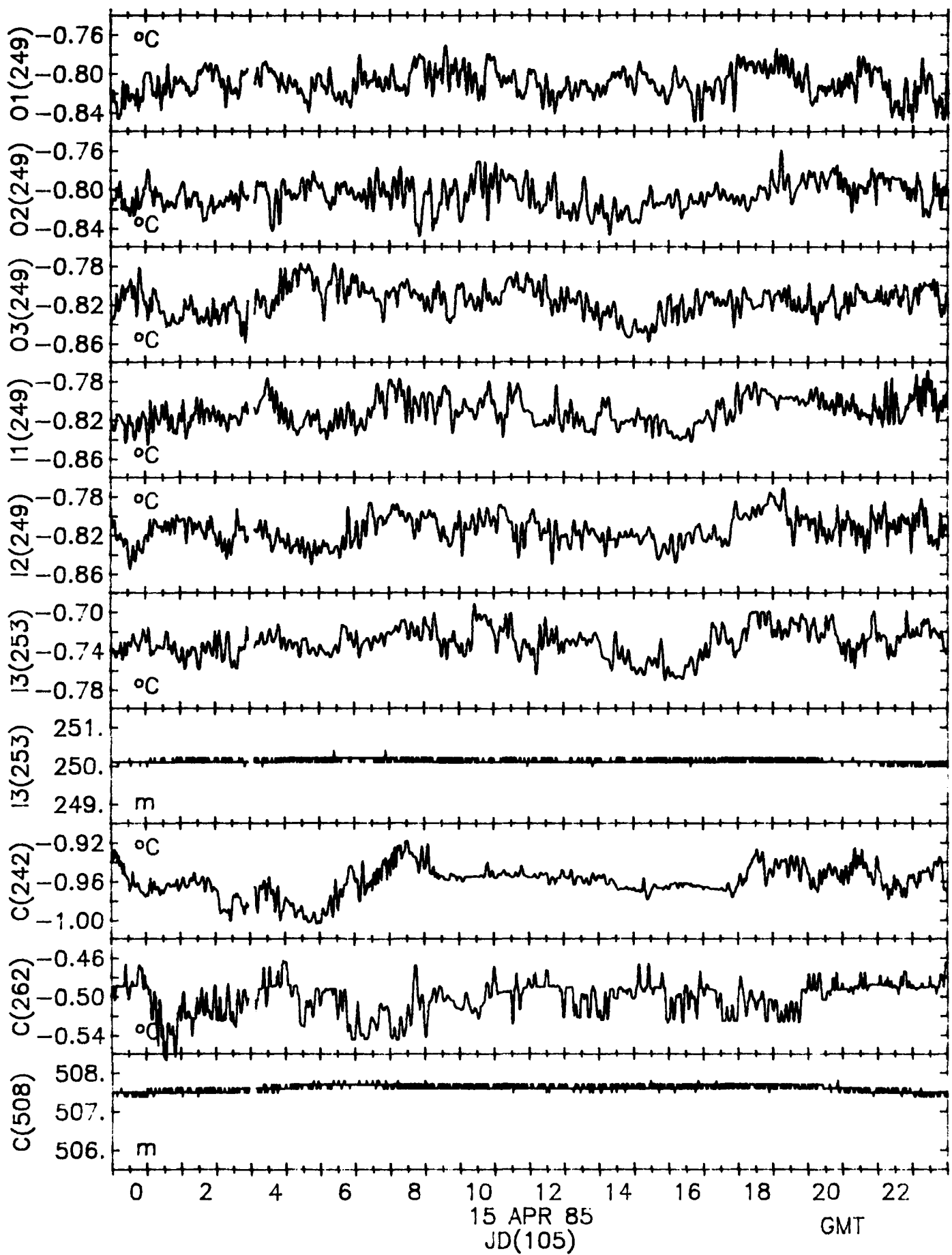


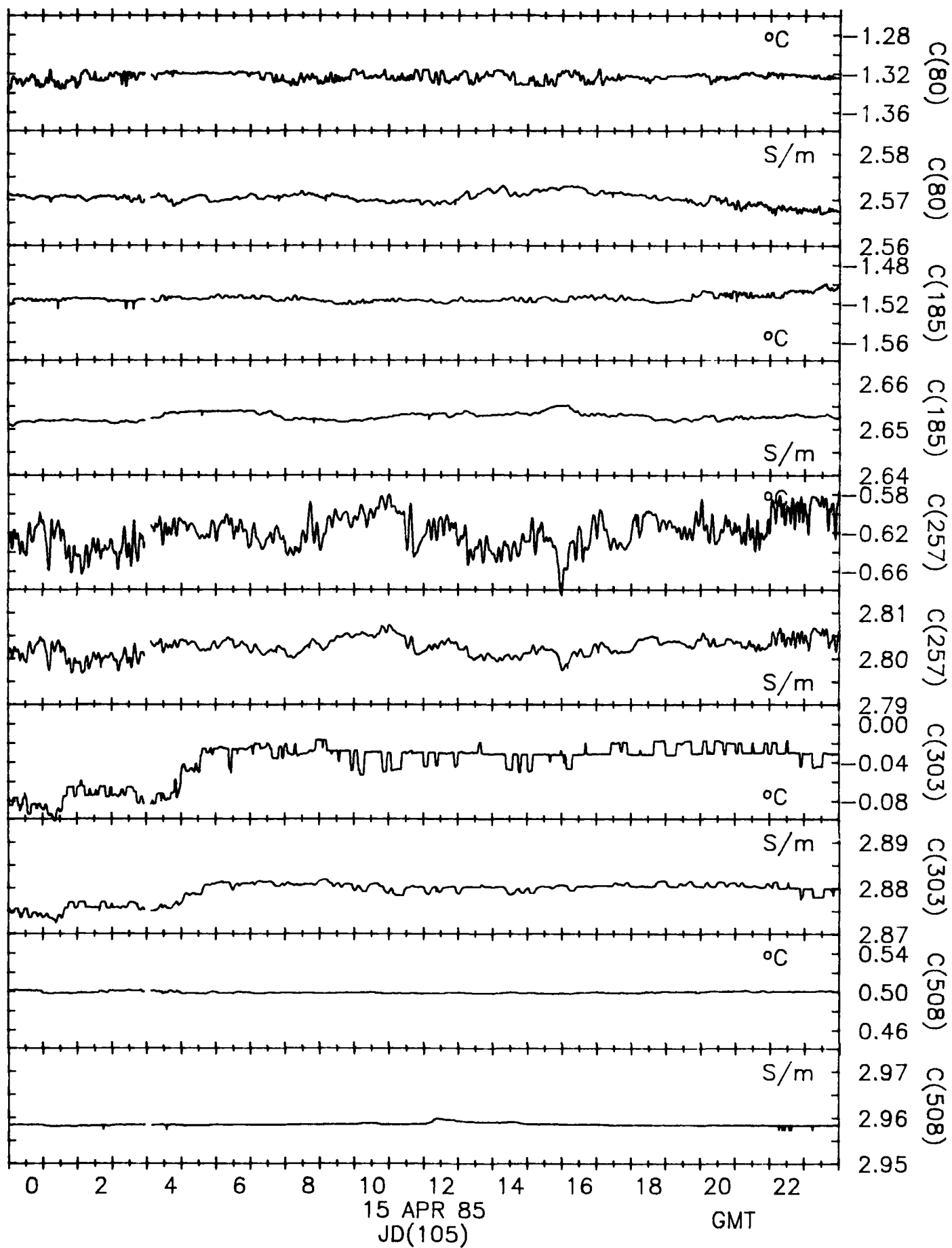


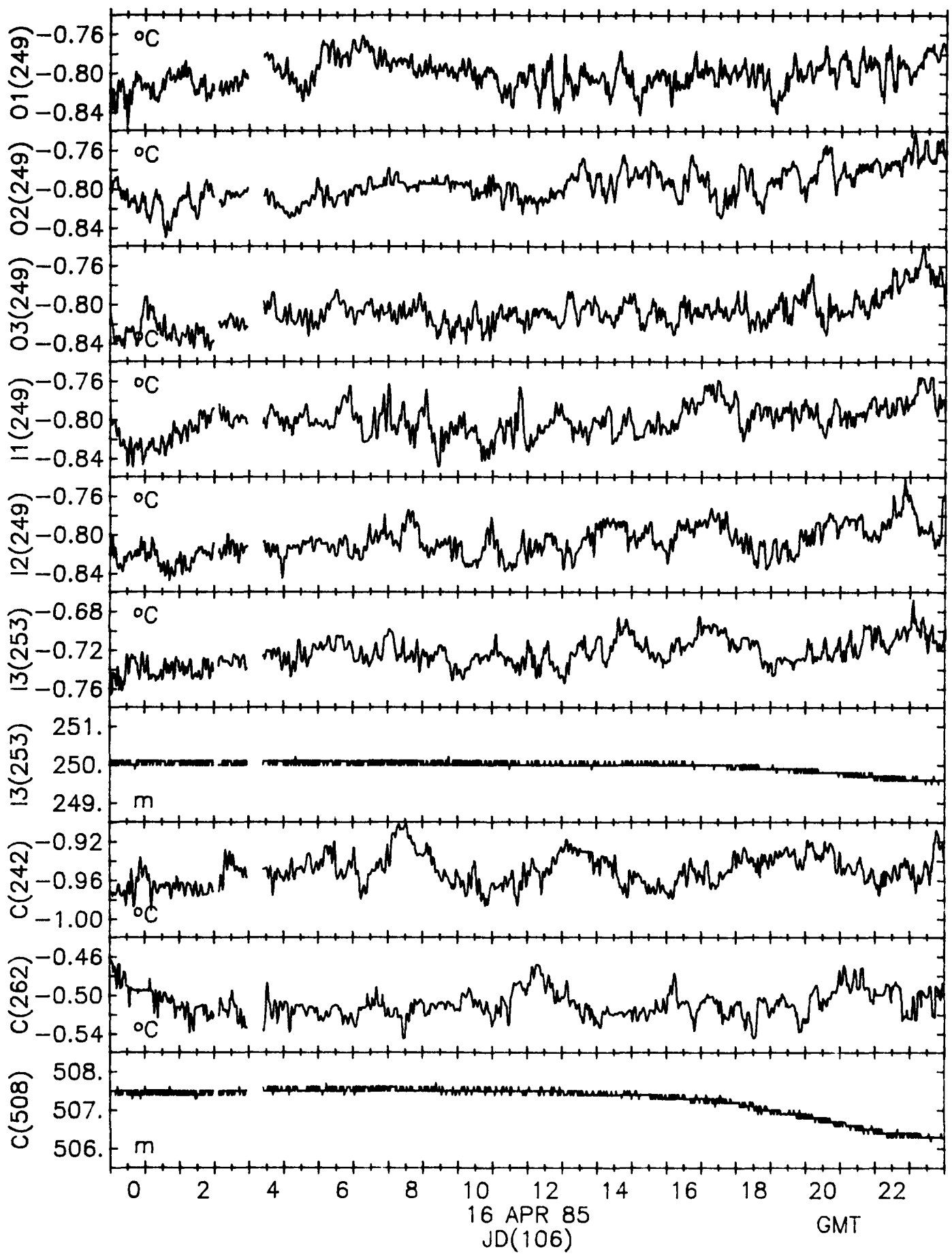


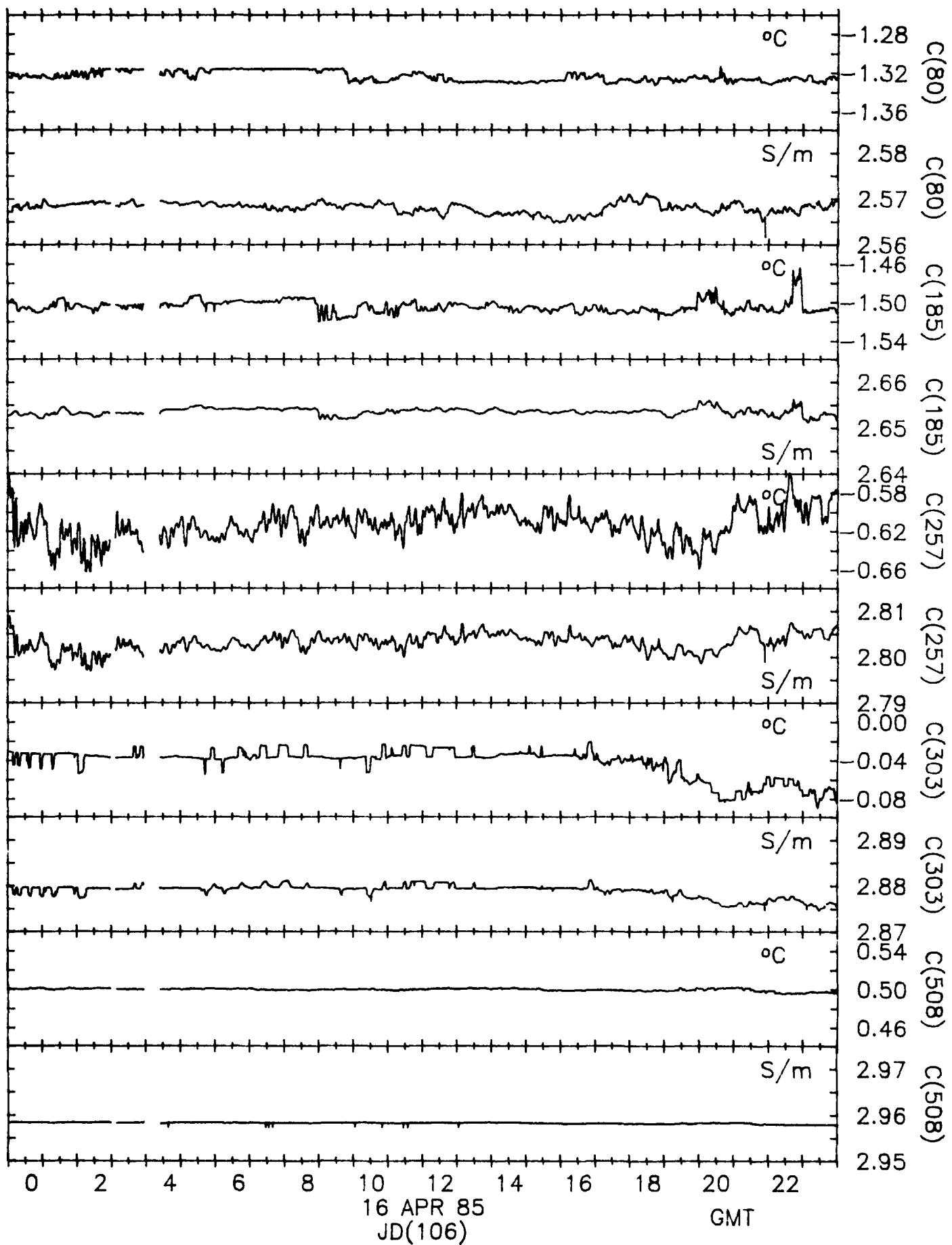




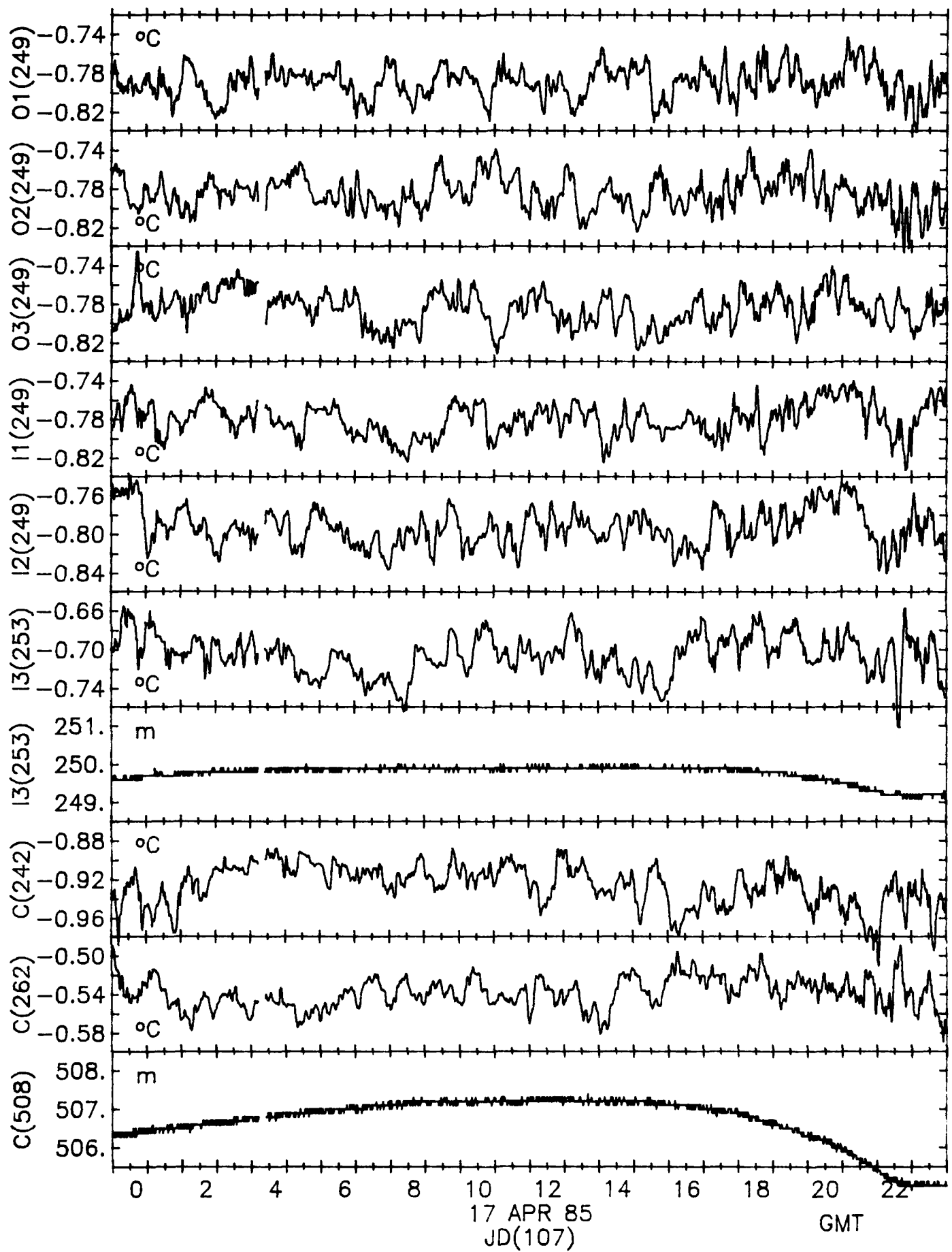


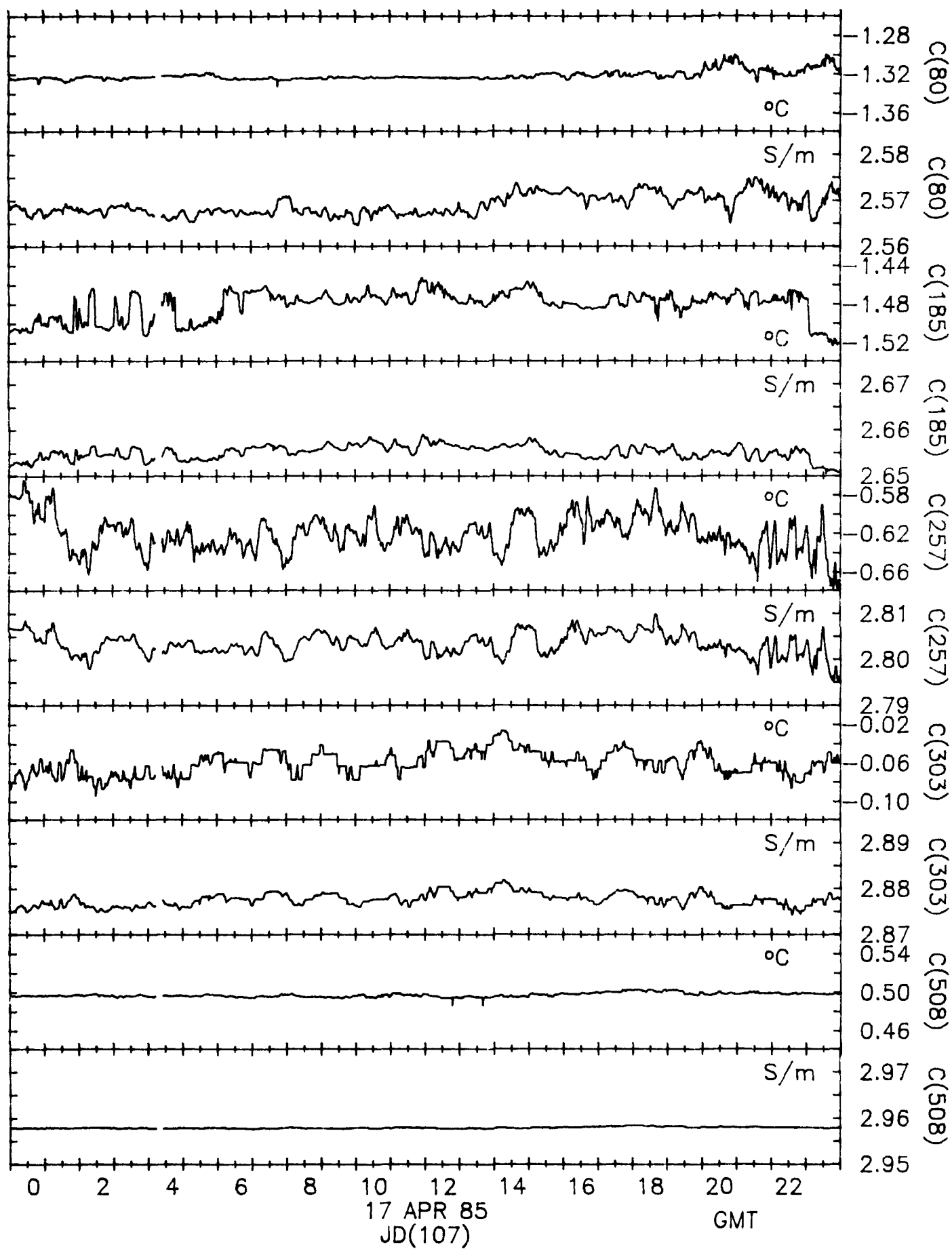


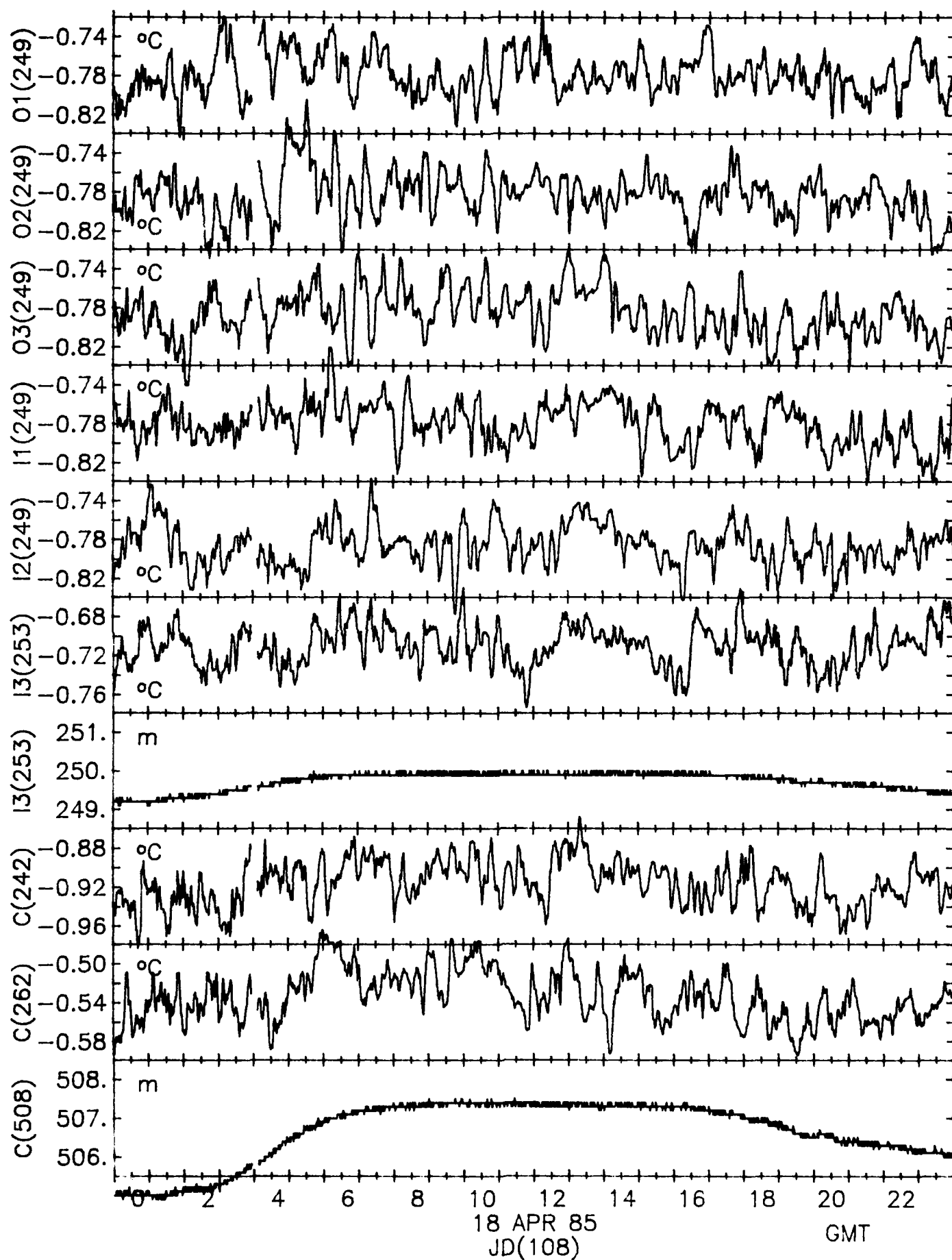


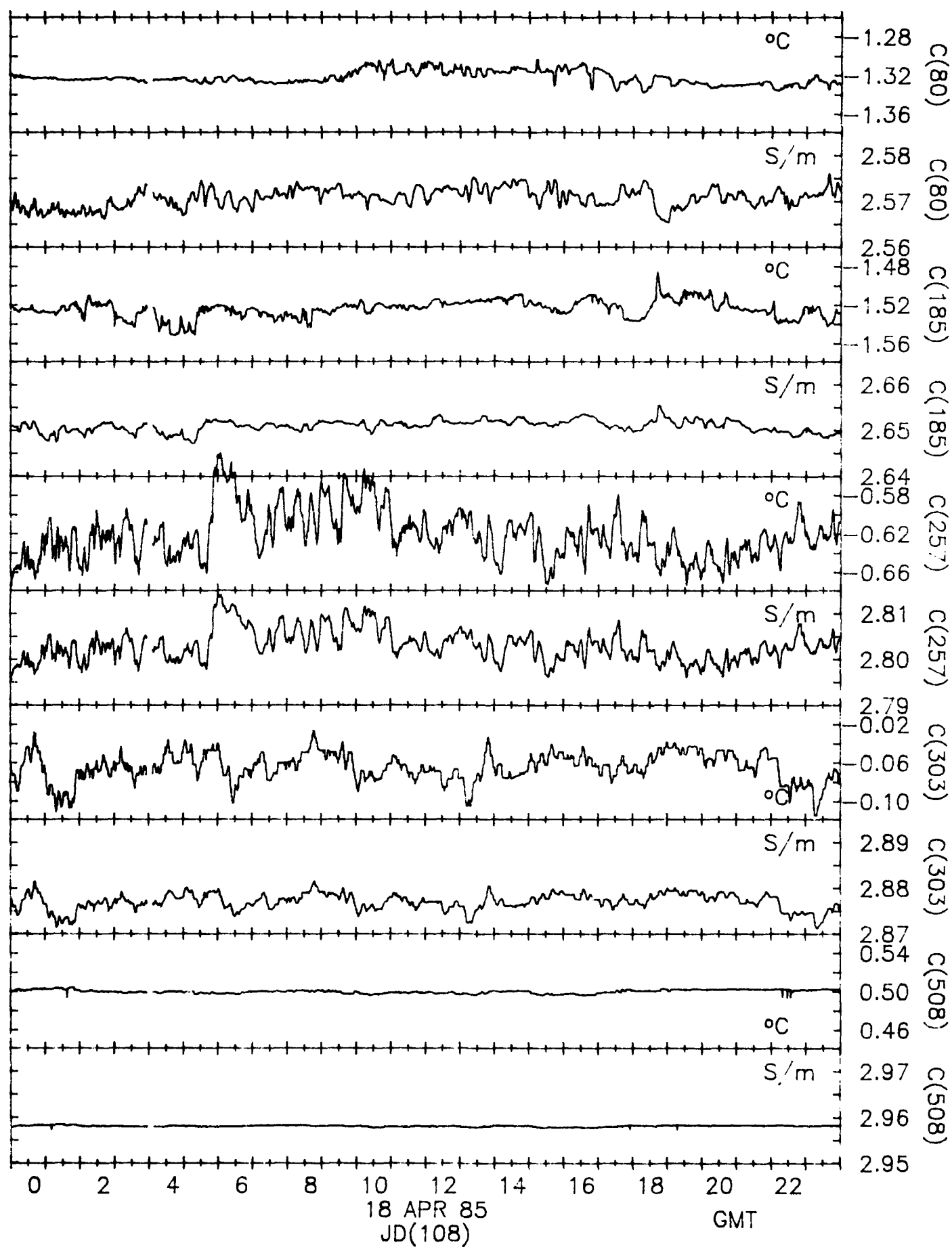


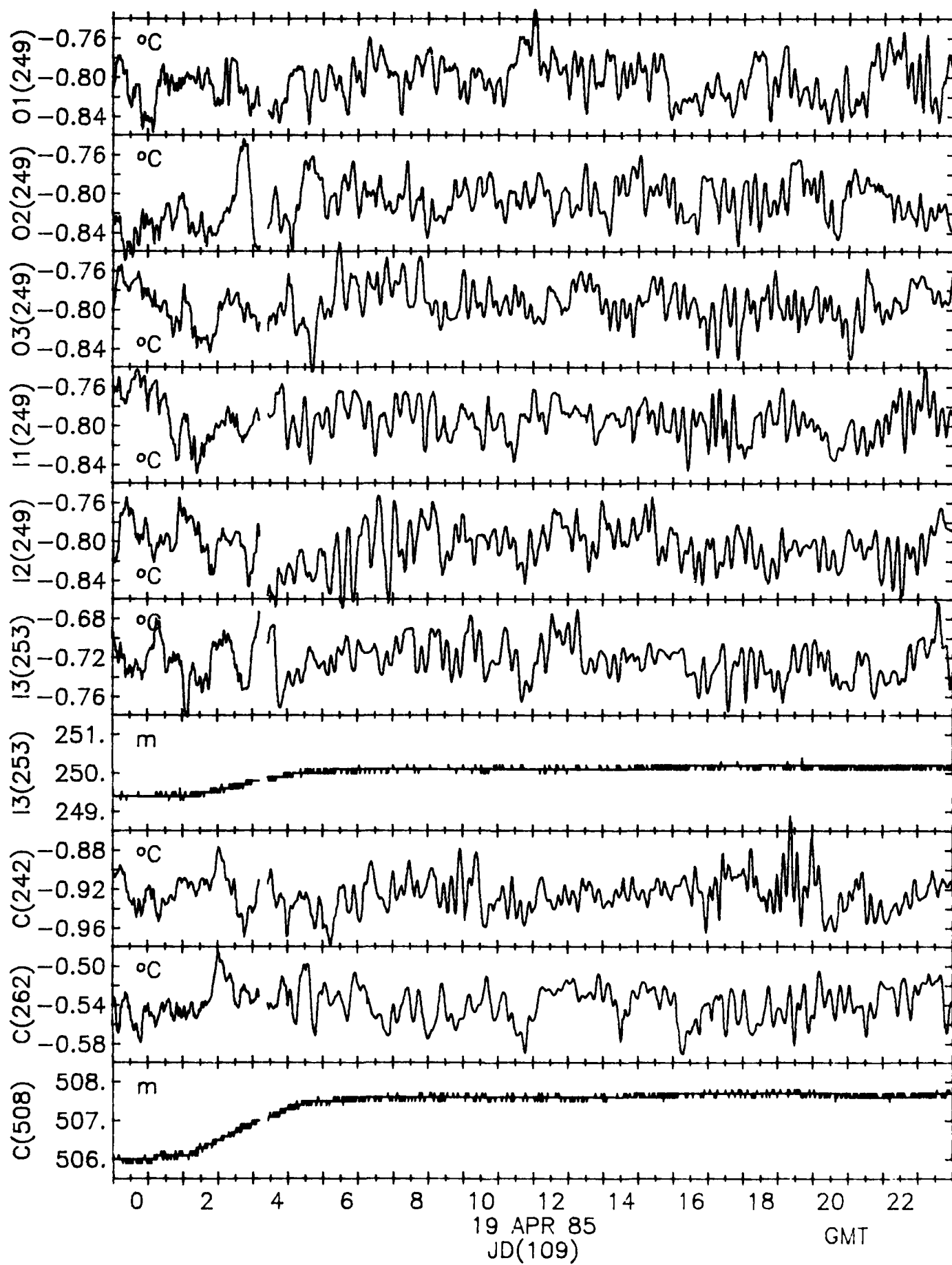


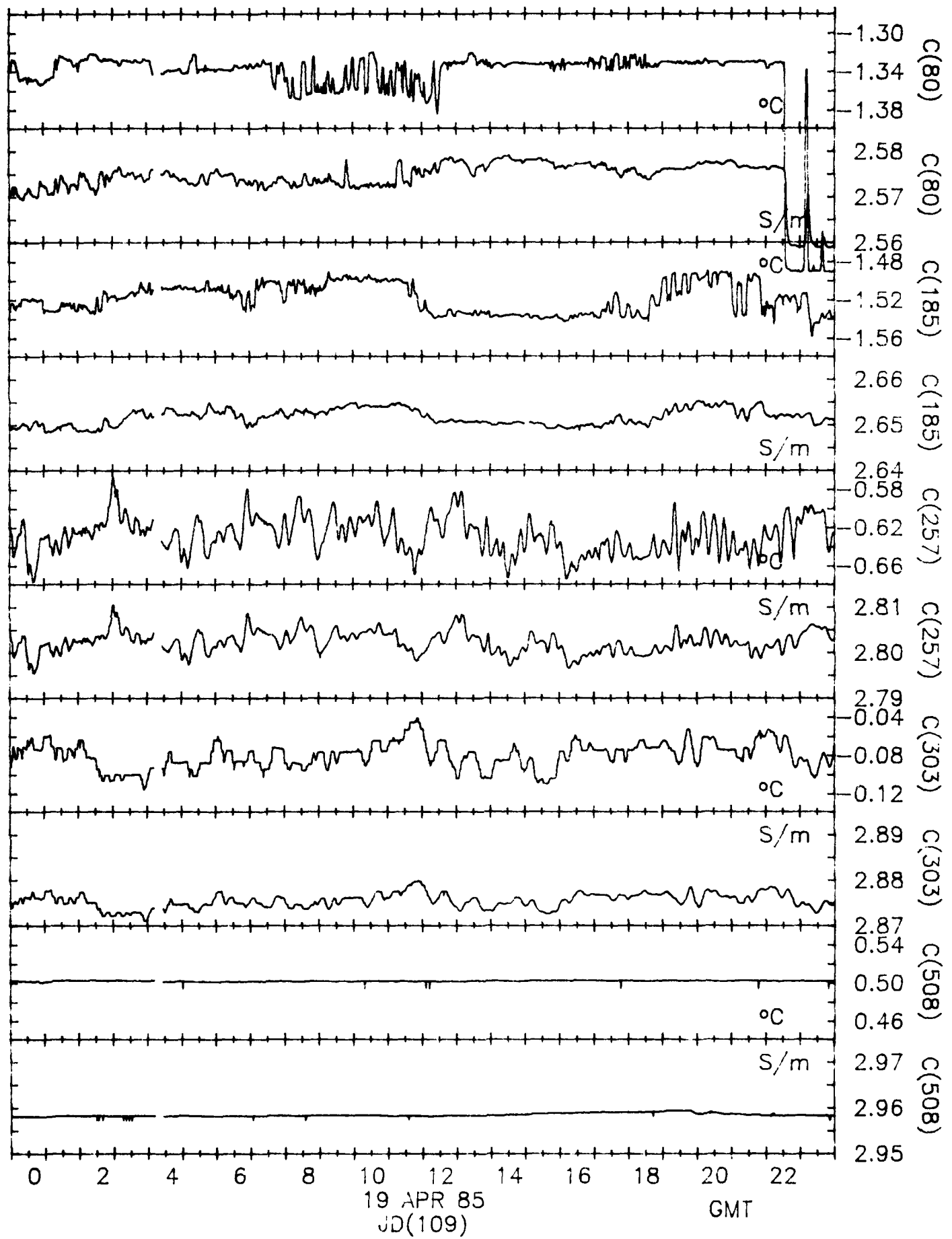












AD-A171 045 MOORED TEMPERATURE AND CONDUCTIVITY OBSERVATIONS DURING 2/3  
 AINEX (ARCTIC INT.) (U) OREGON STATE UNIV CORVALLIS COLL  
 OF OCEANOGRAPHY M D LEVINE ET AL. JUN 86 DATA-123  
 UNCLASSIFIED N00014-84-C-0218 F/G 8/10 NL

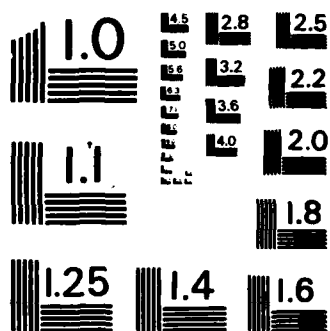
MOORED TEMPERATURE AND CONDUCTIVITY OBSERVATIONS DURING 2/3  
 AINEX (ARCTIC INT.) (U) OREGON STATE UNIV CORVALLIS COLL  
 OF OCEANOGRAPHY M D LEVINE ET AL. JUN 86 DATA-123  
 N00014-84-C-0218 F/G 8/10 NL

UNCLASSIFIED

**NO0014-84-C-0218**

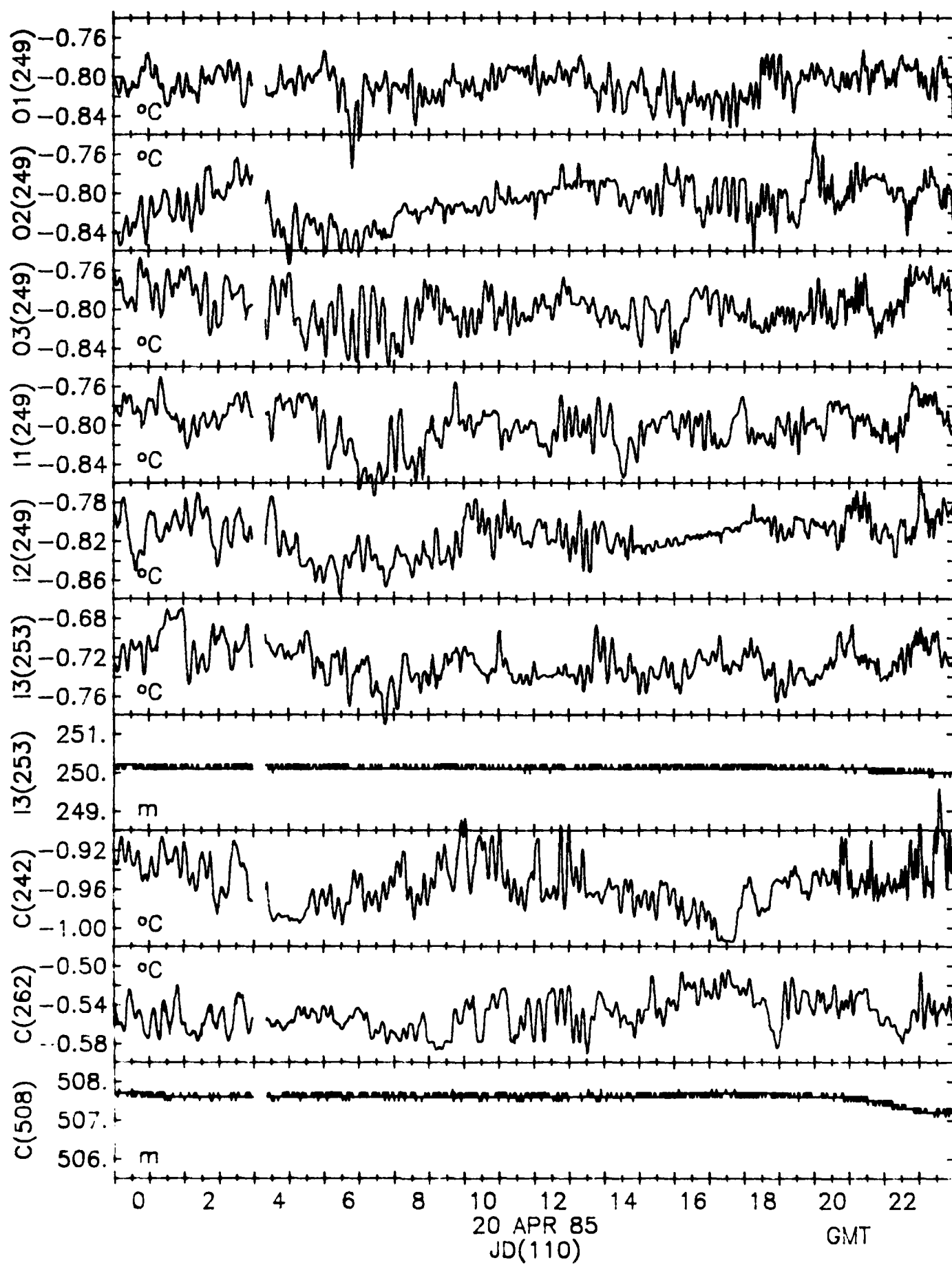
F/G 8/10

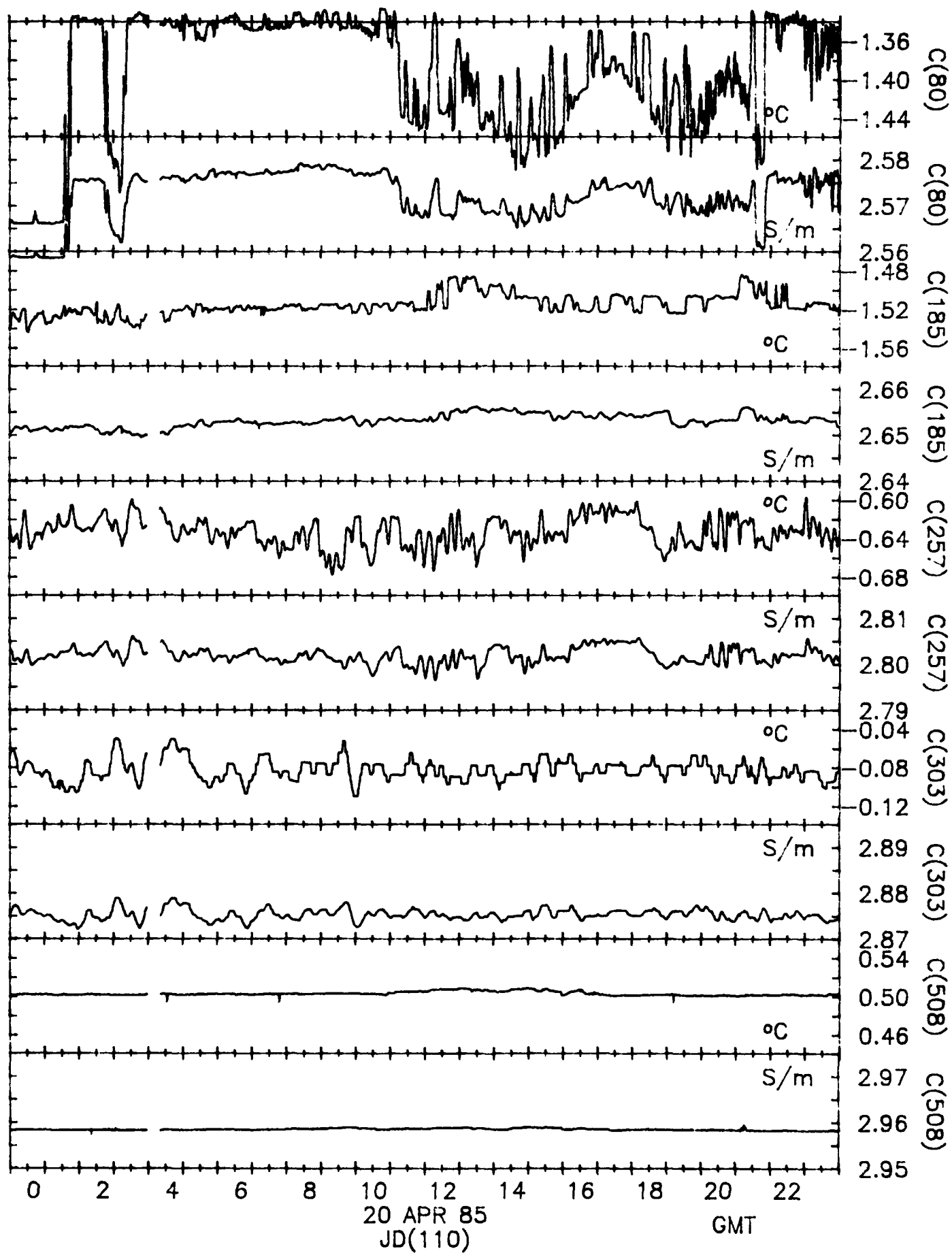
ML

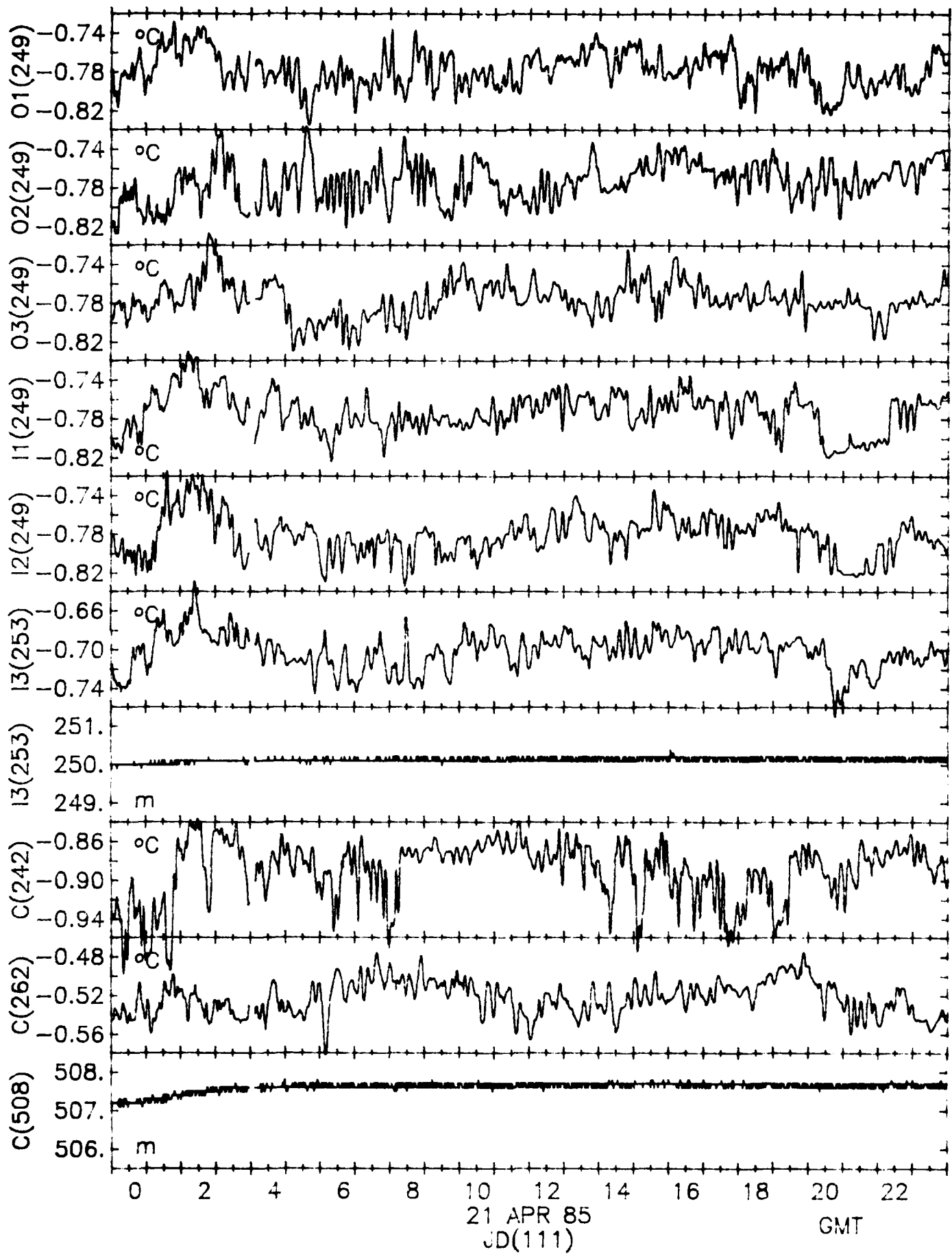


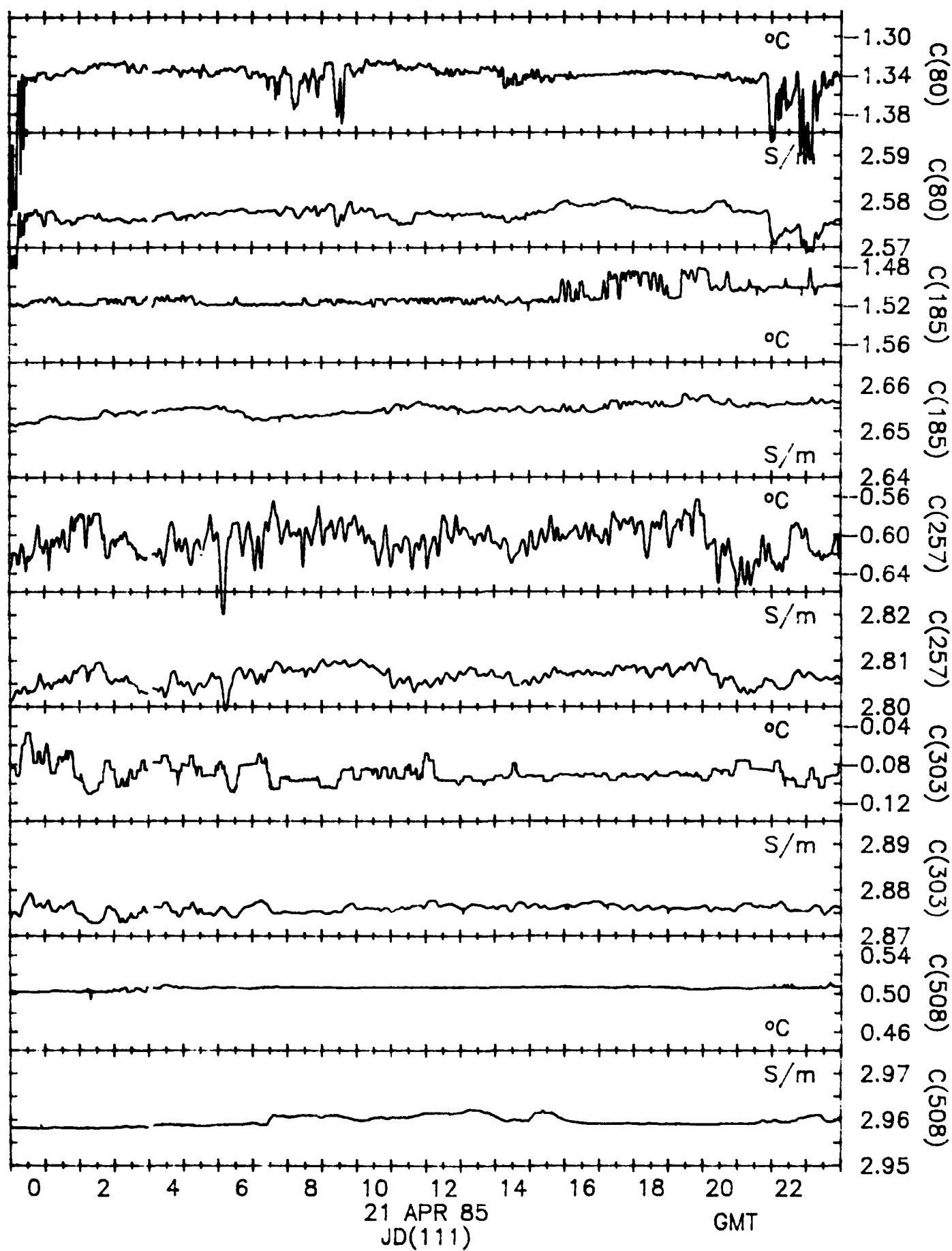
MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

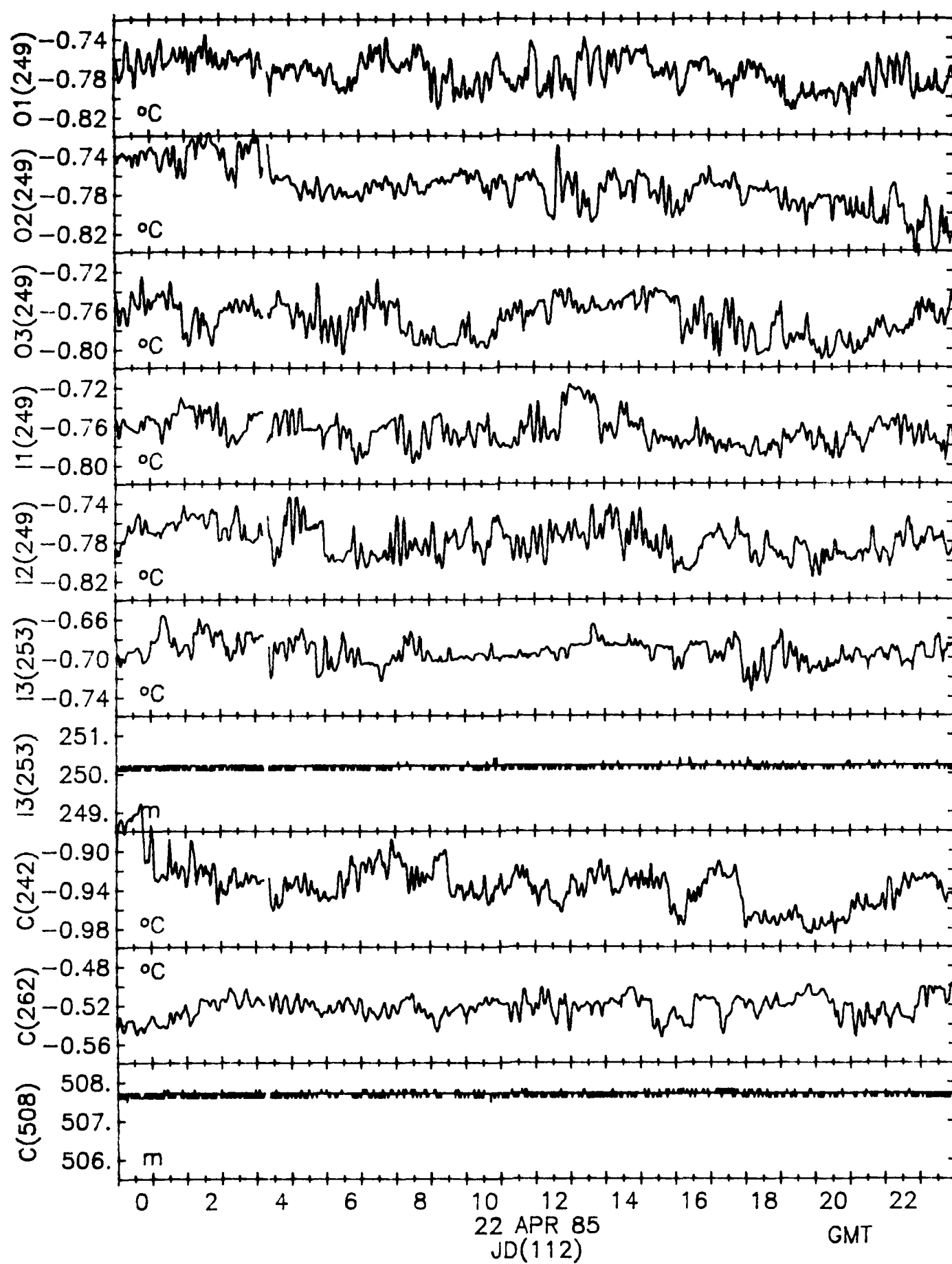


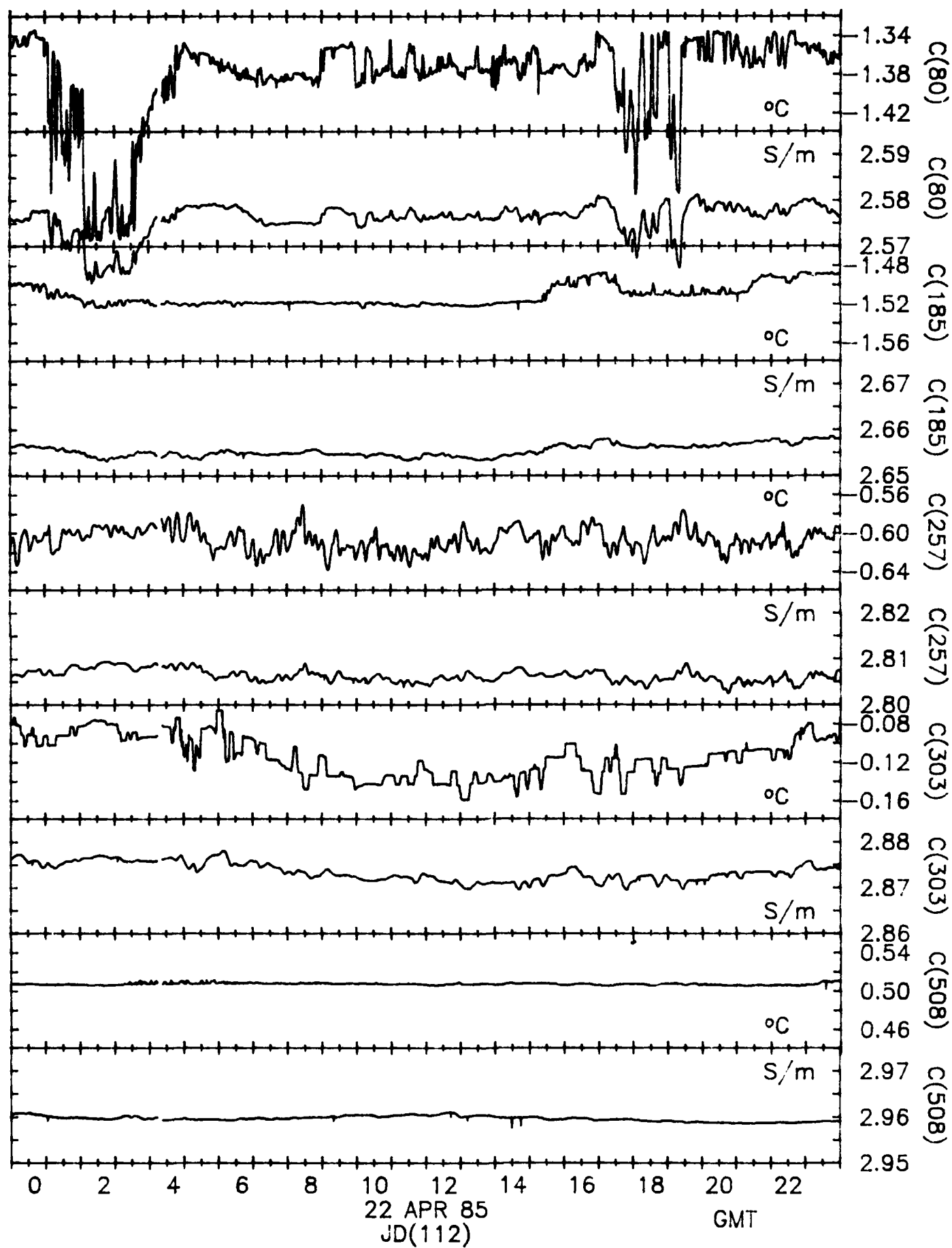


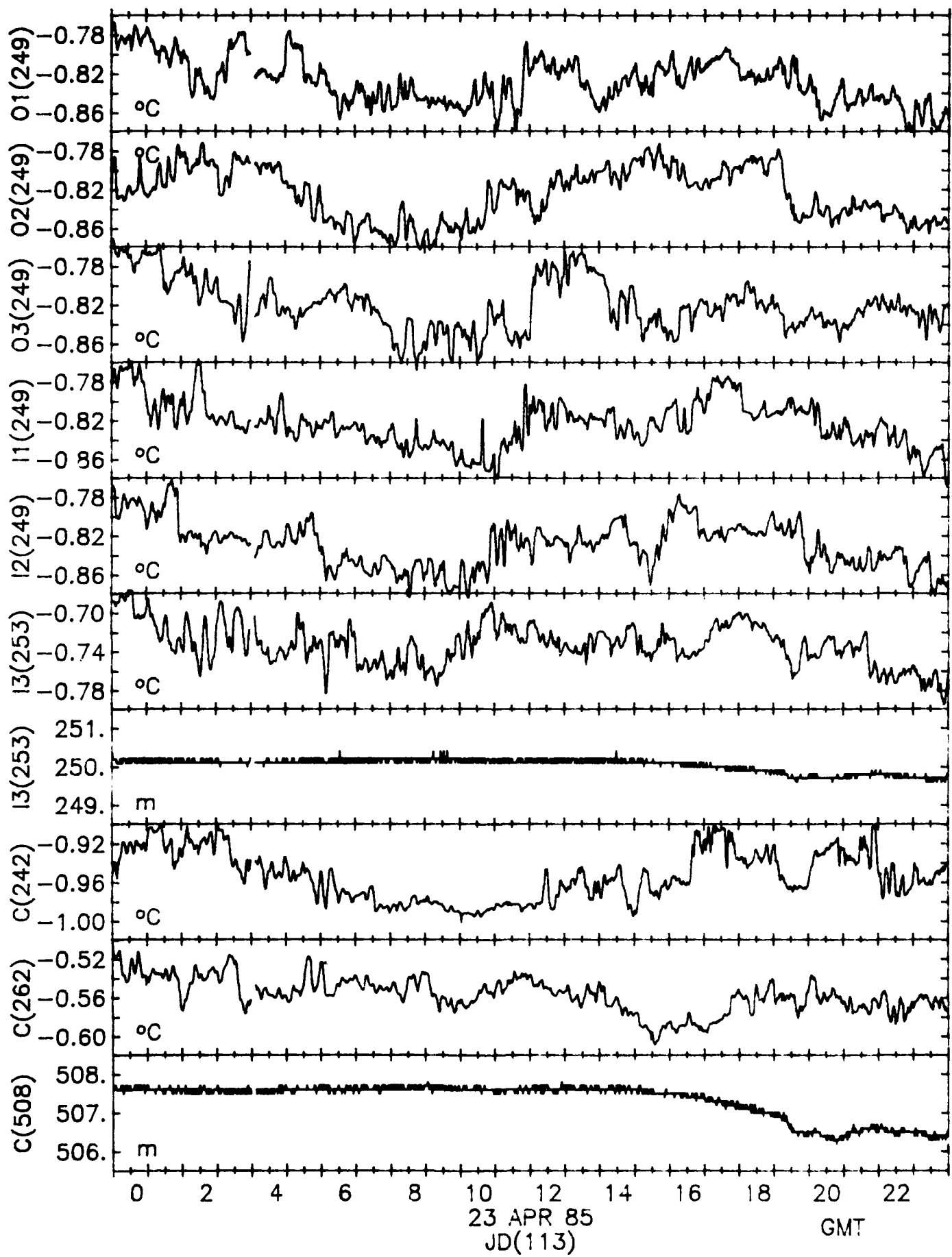


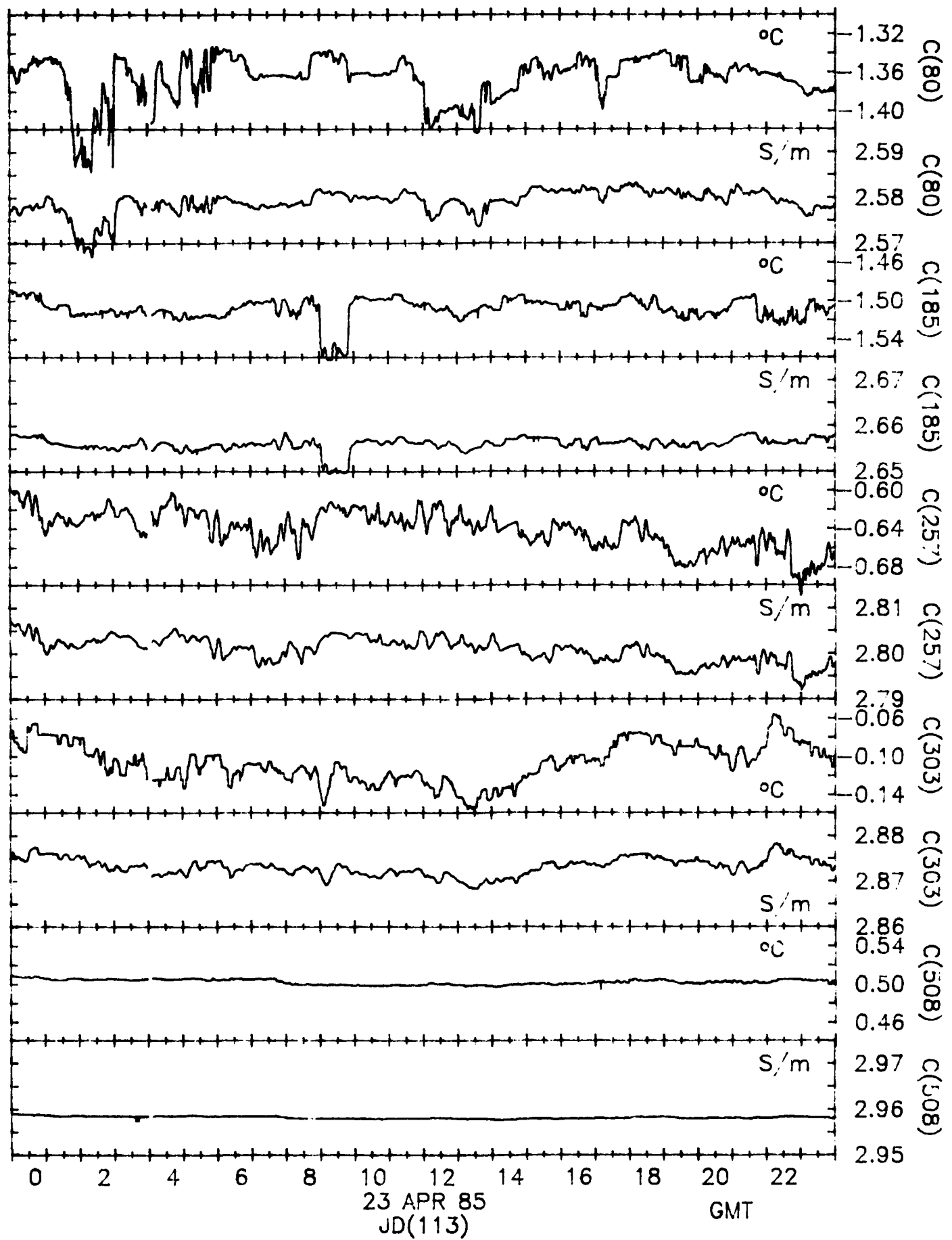




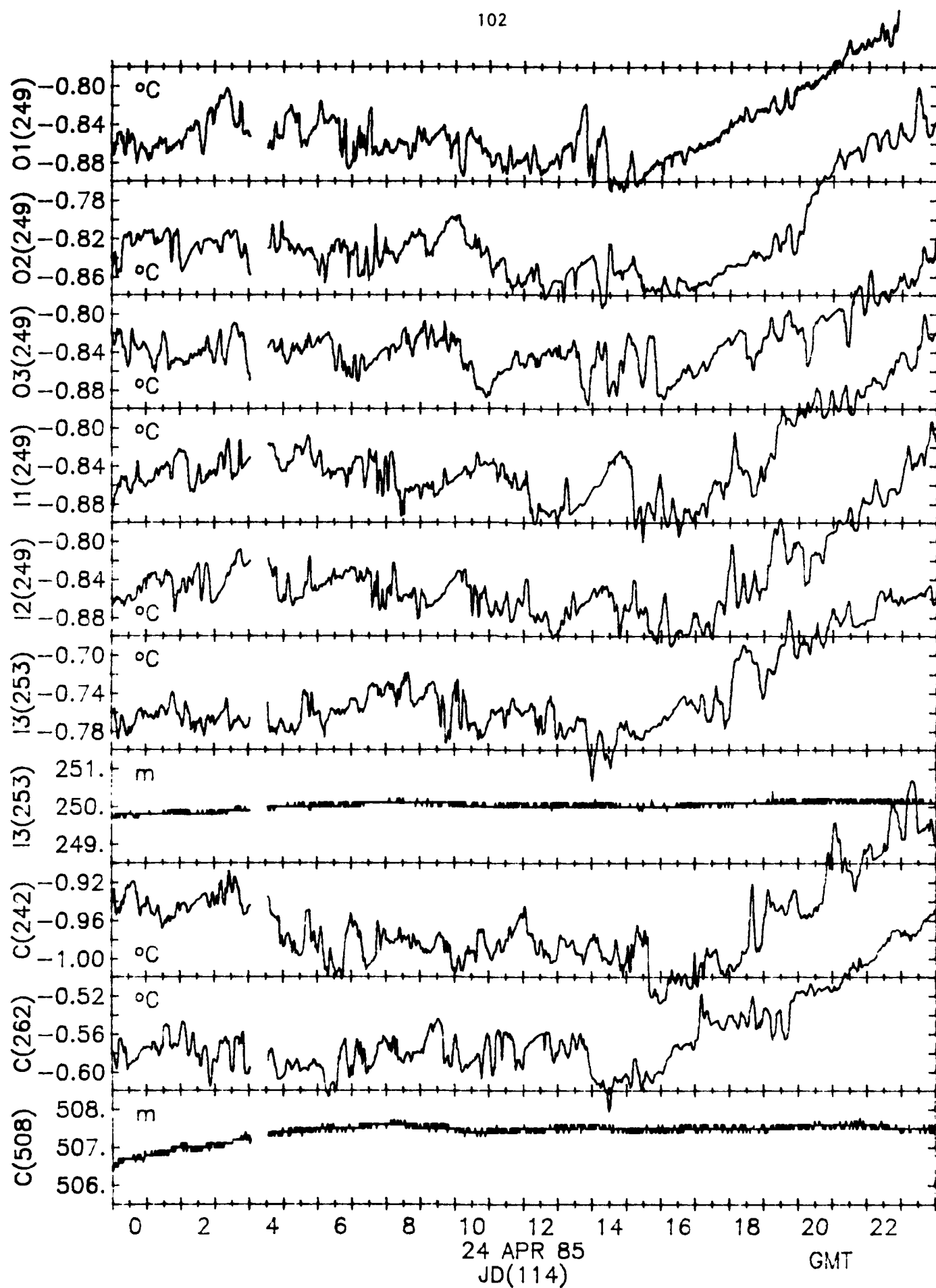


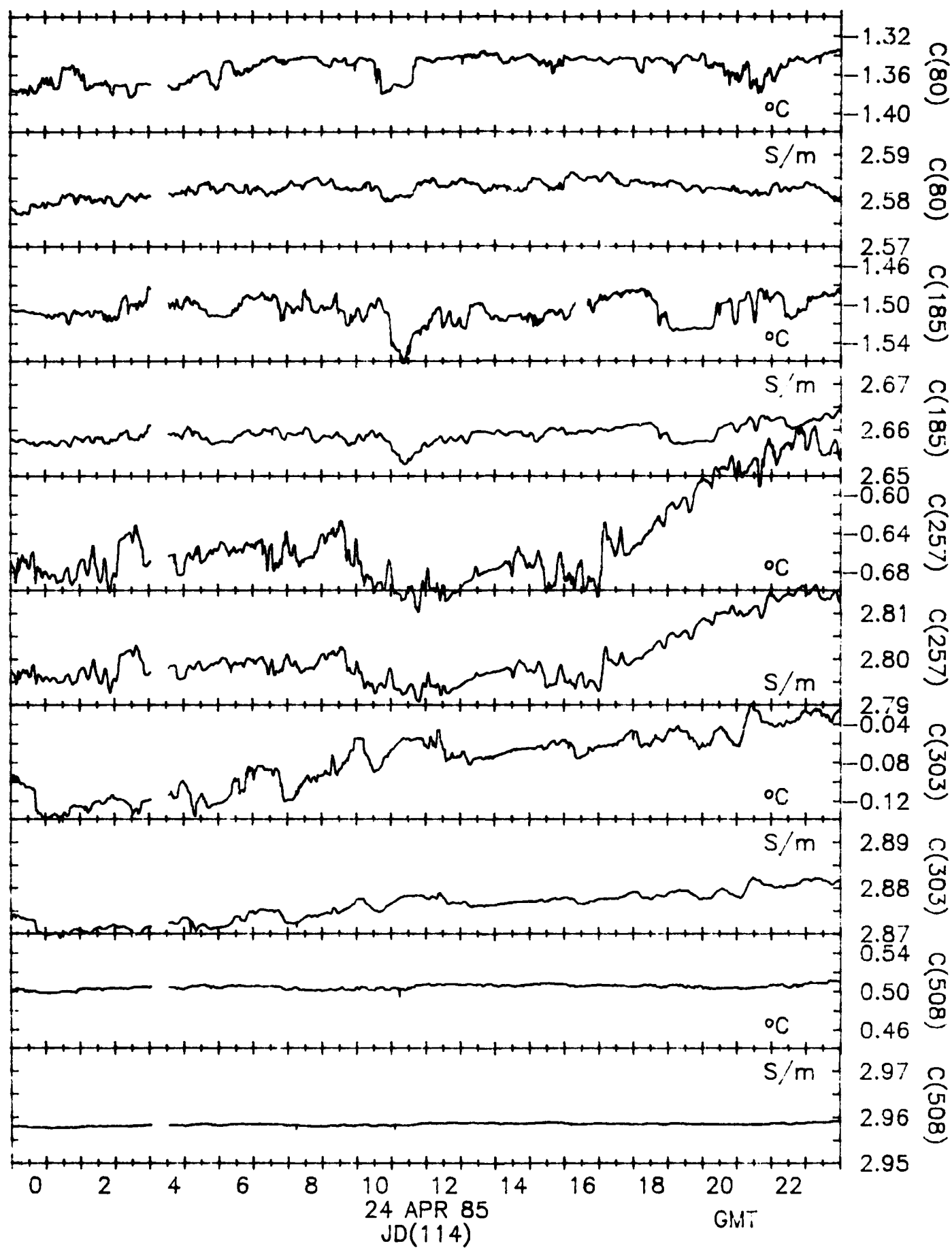


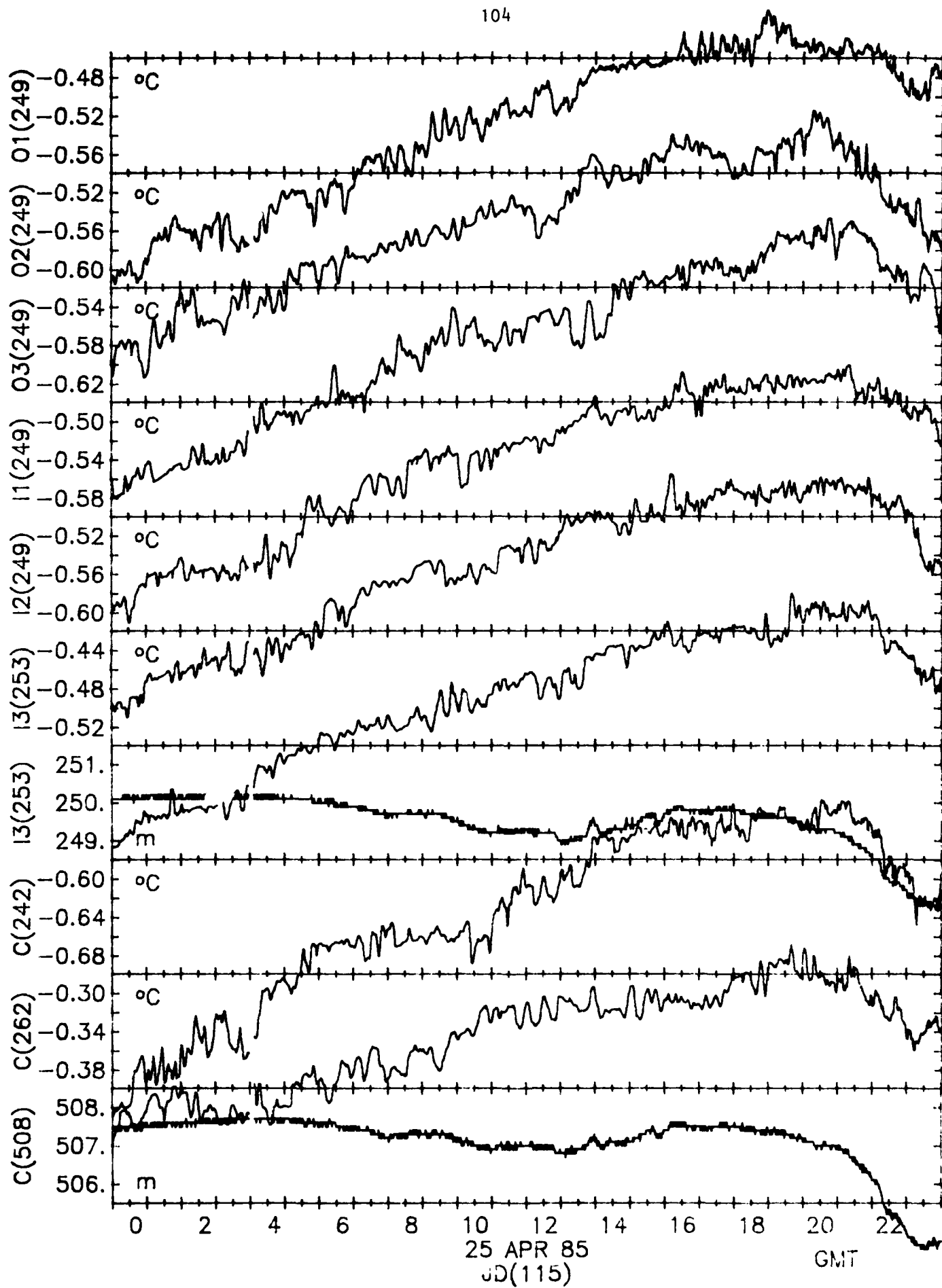


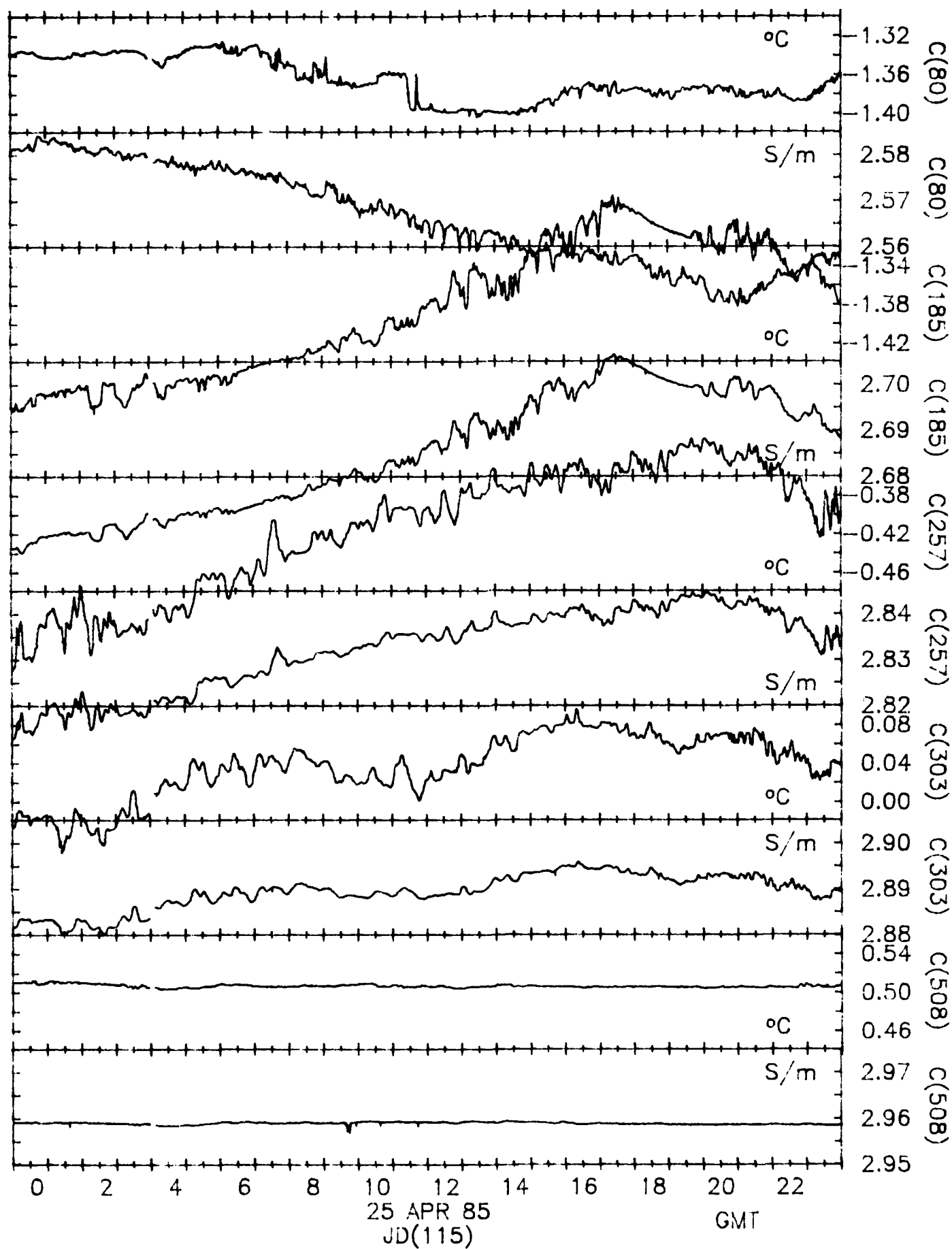


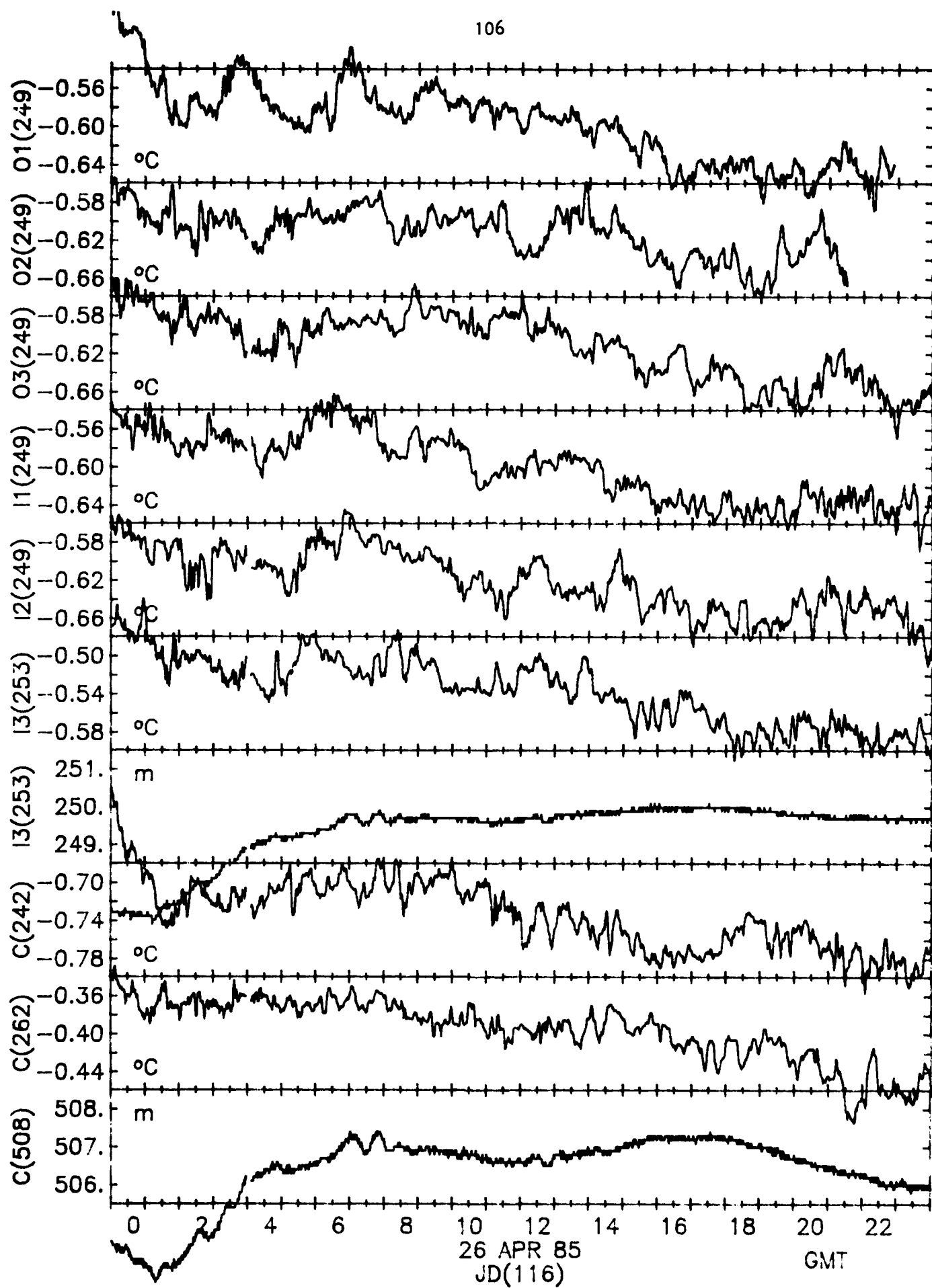


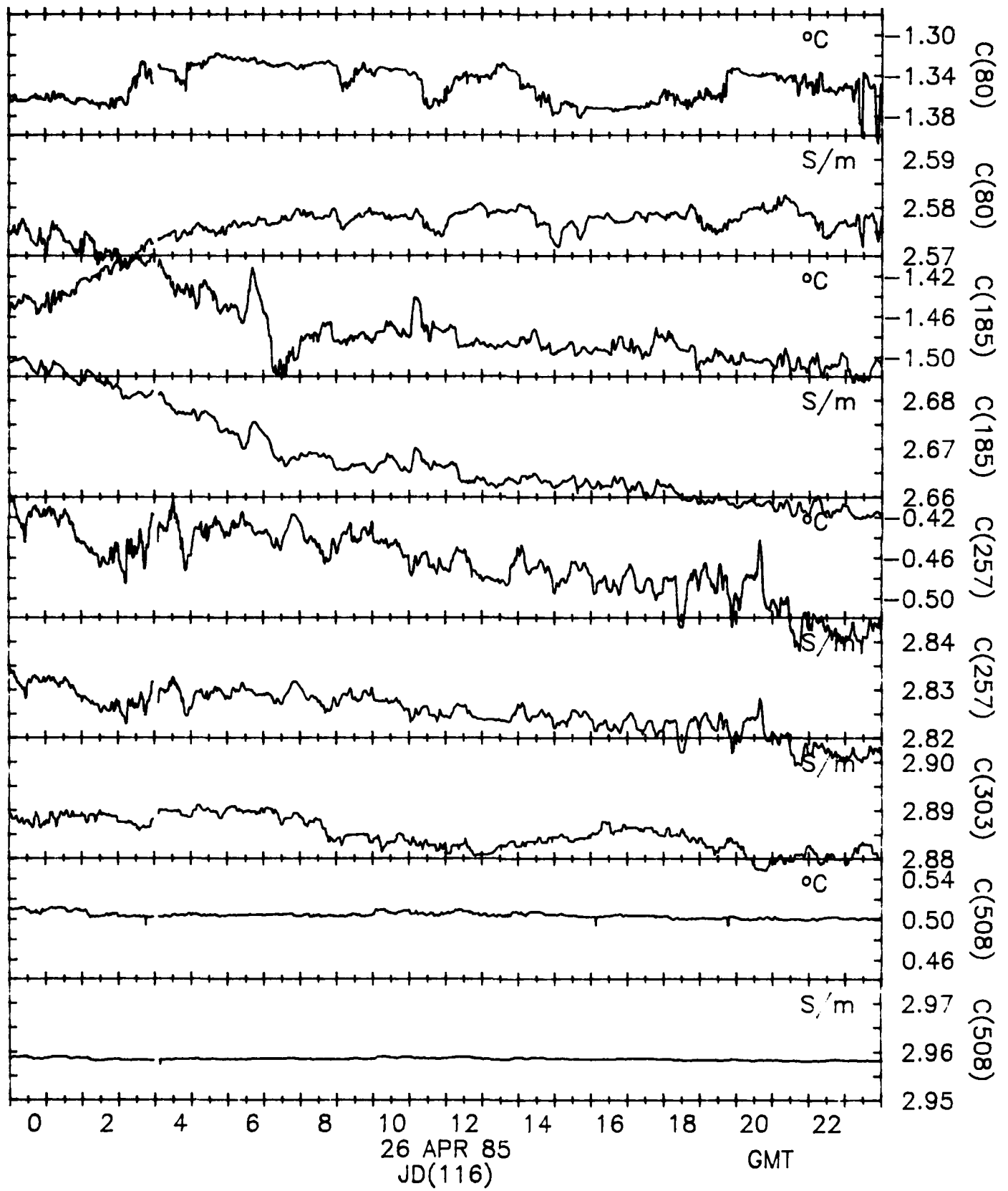


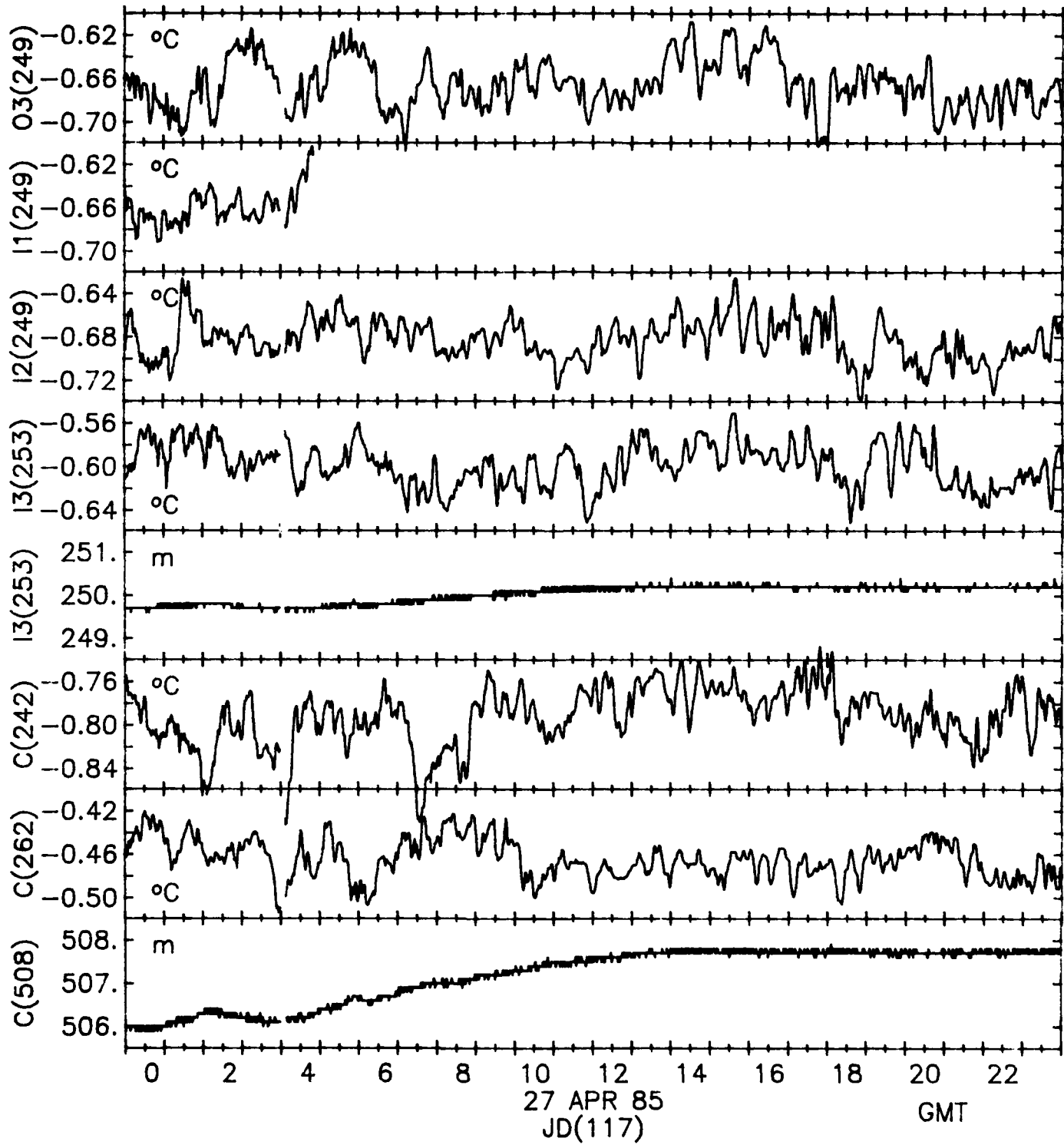


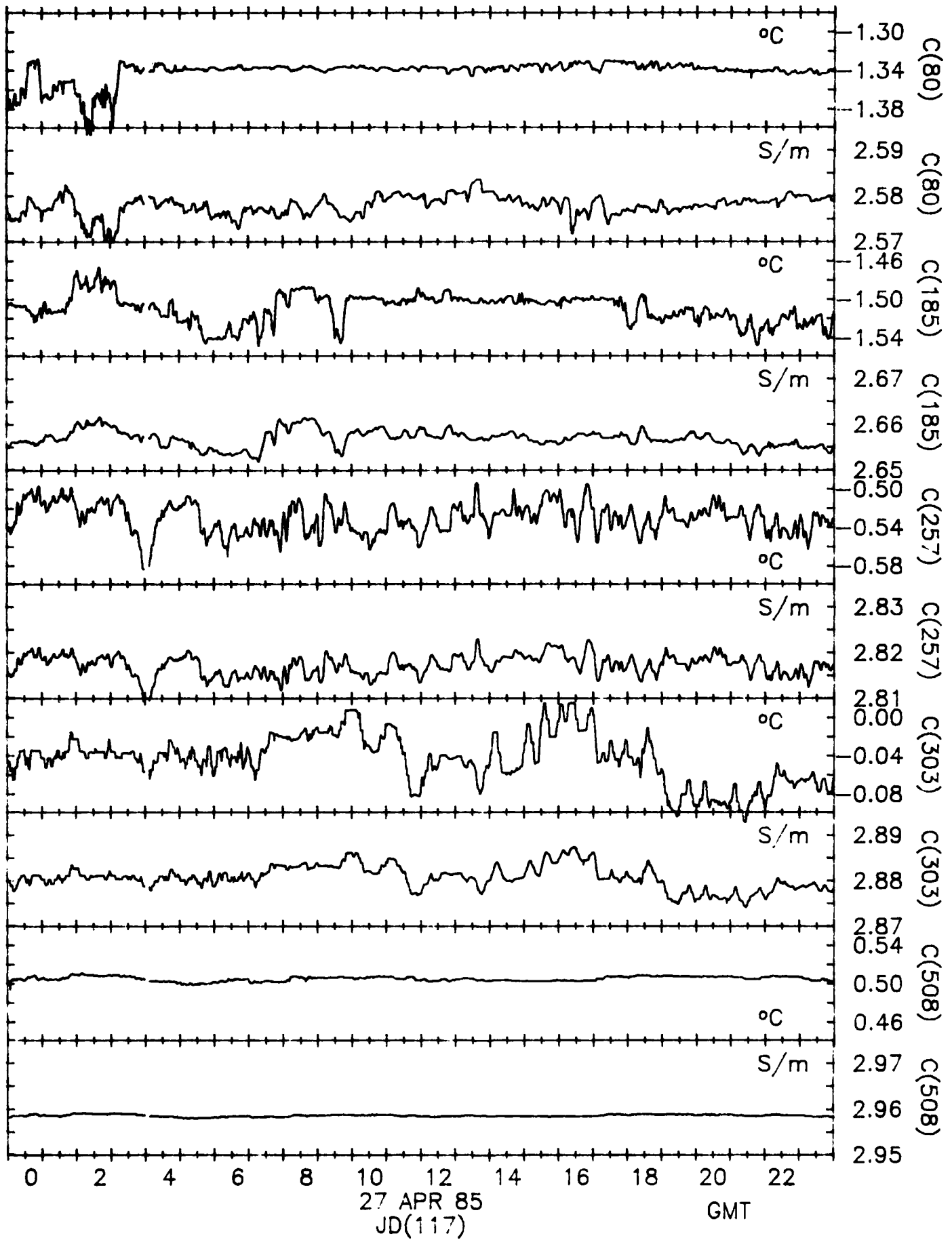




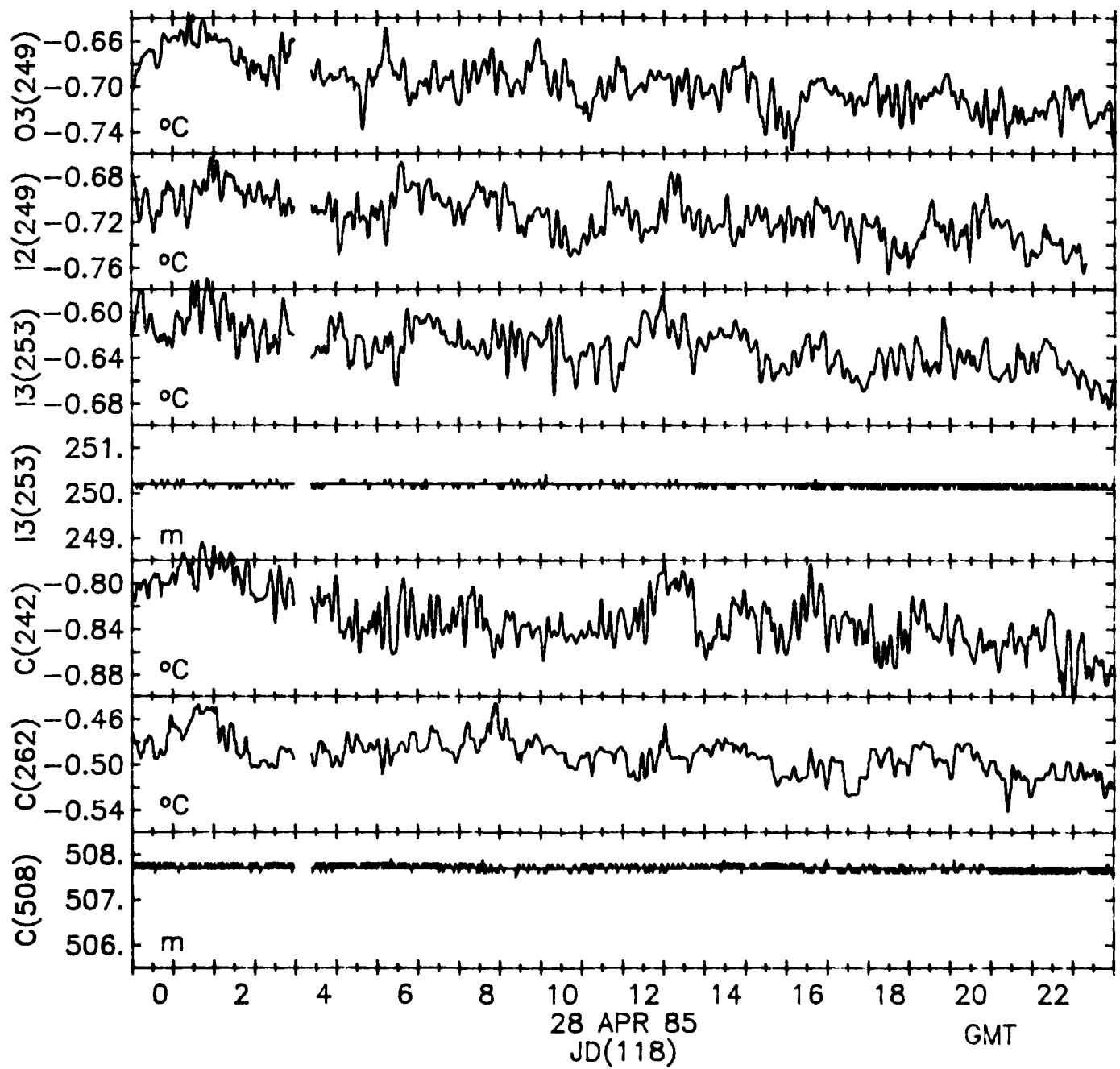


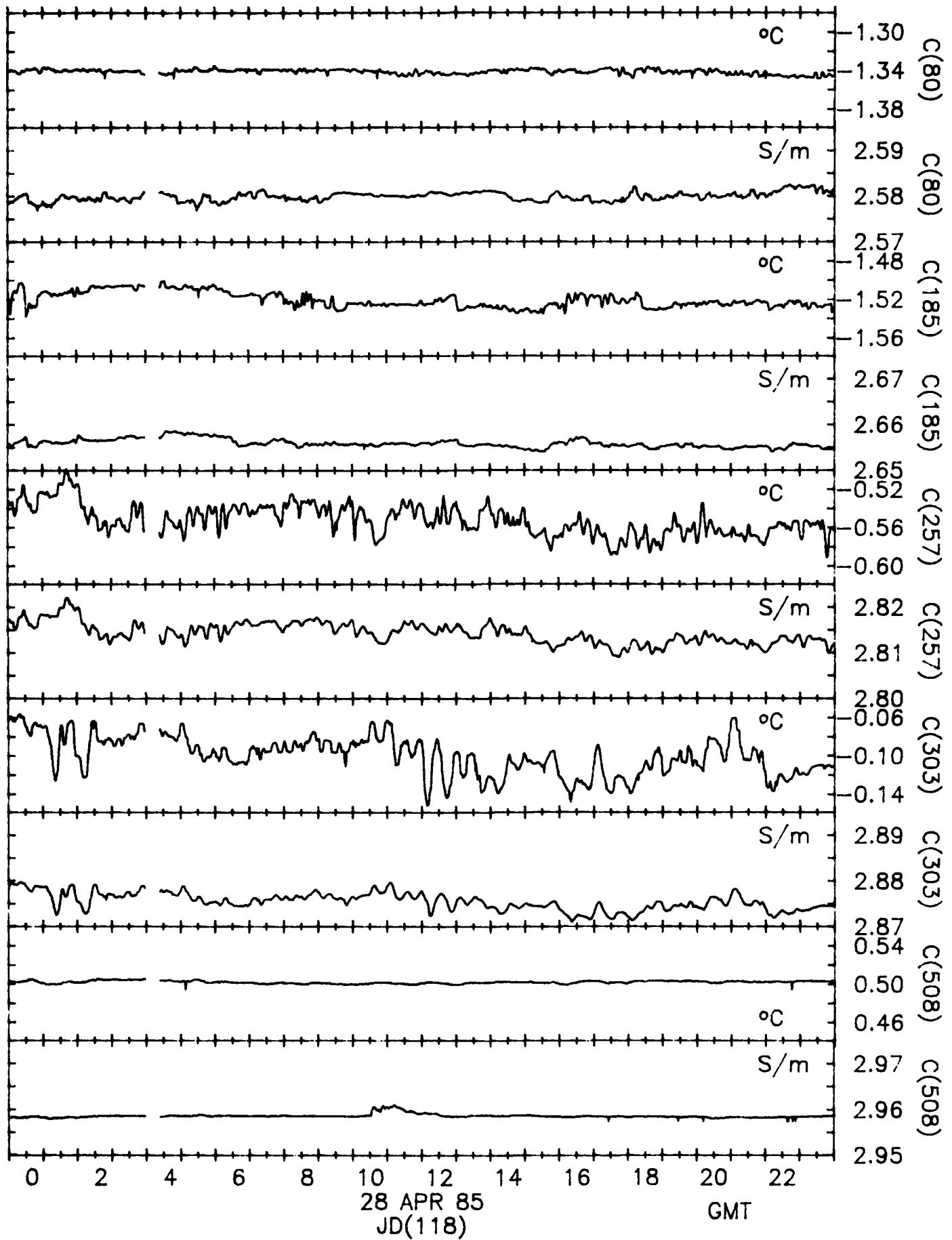


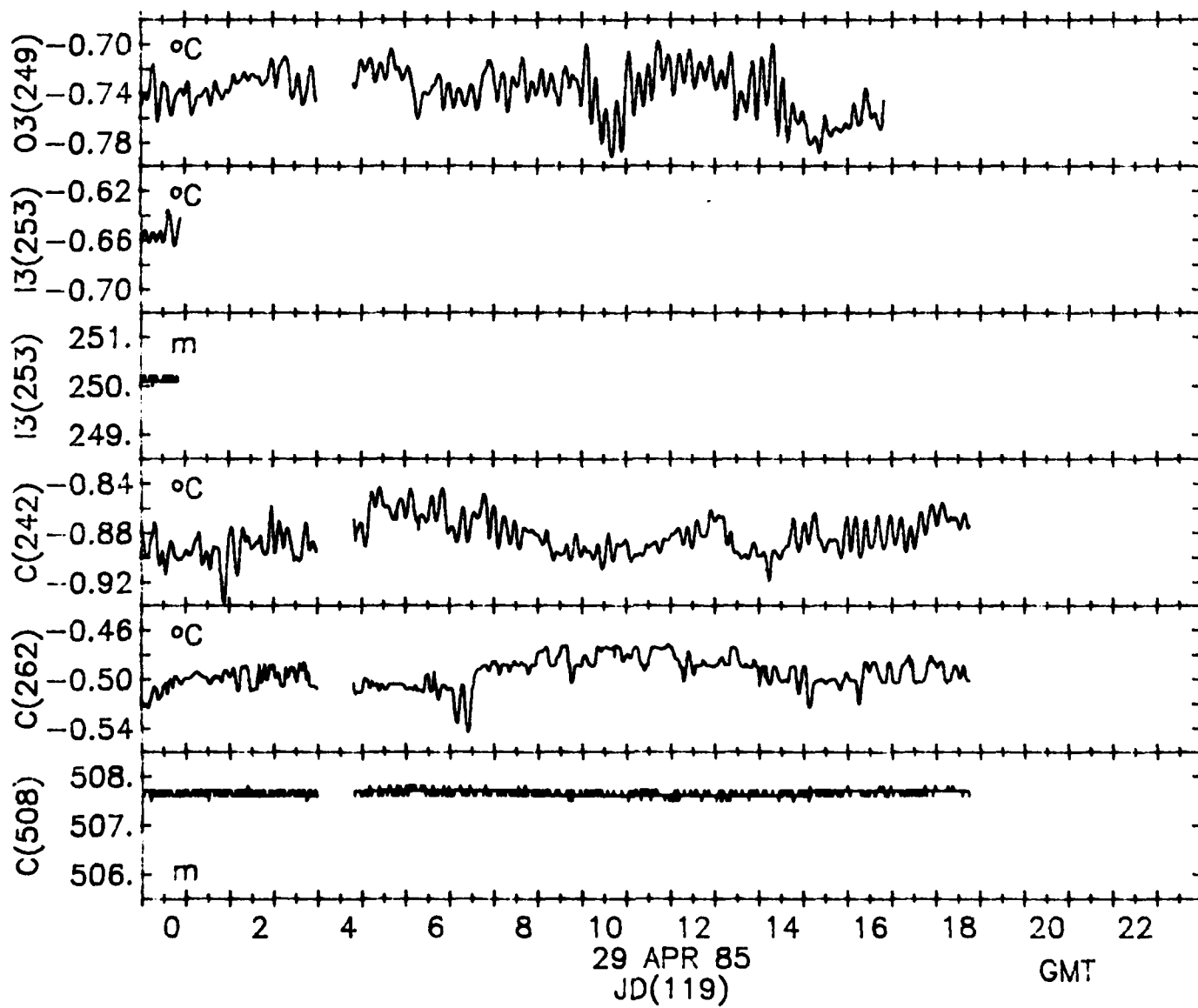


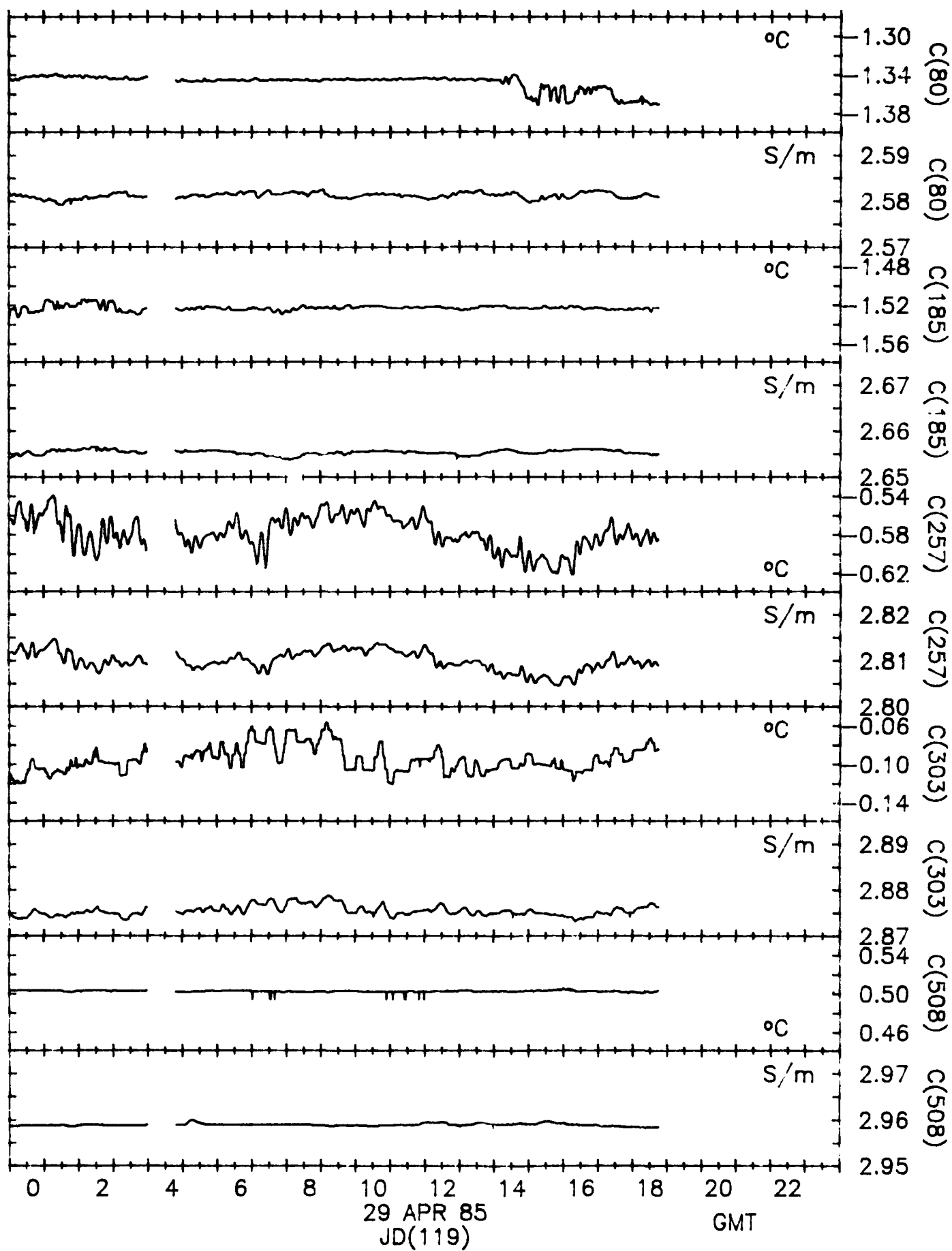








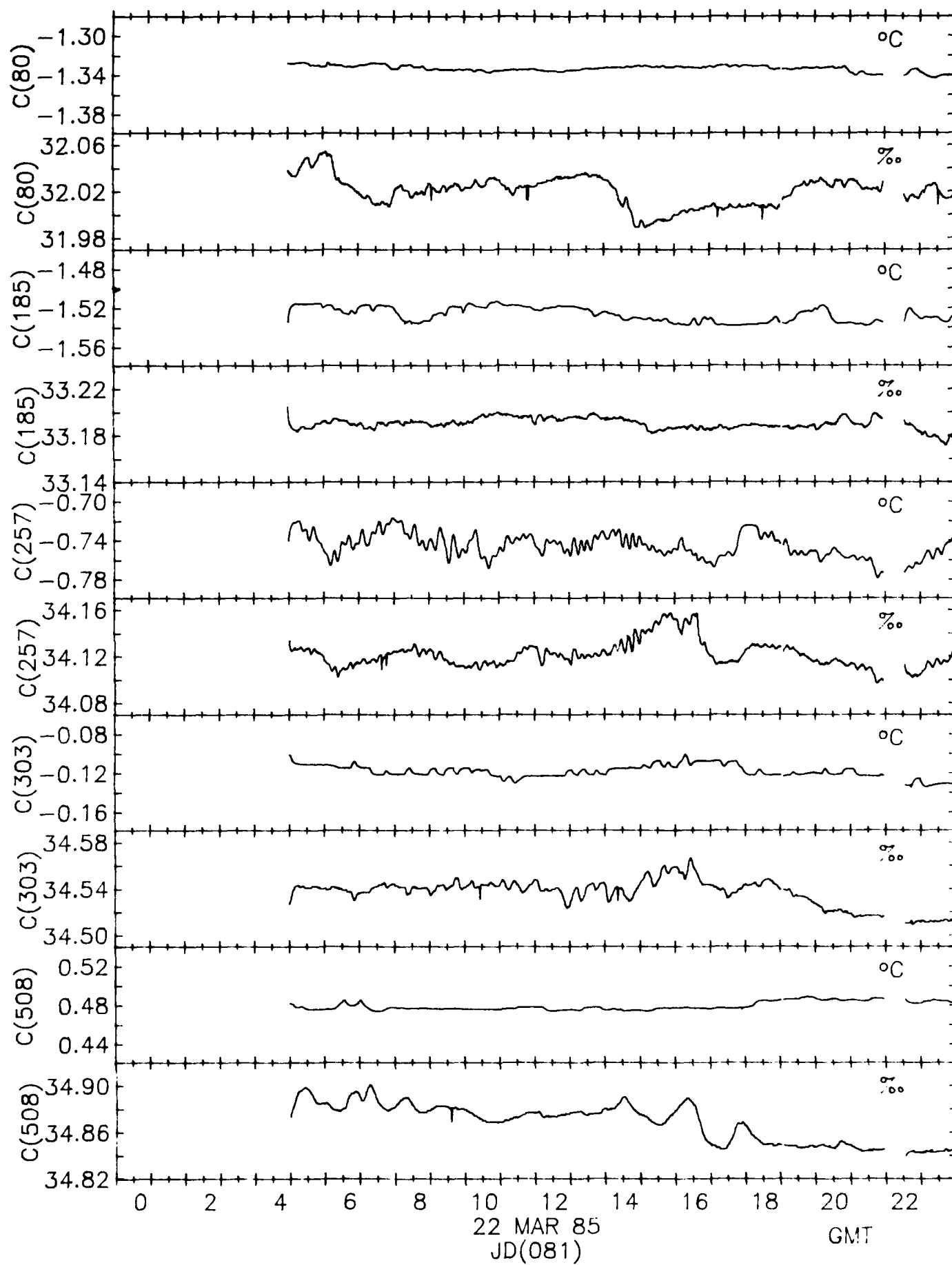


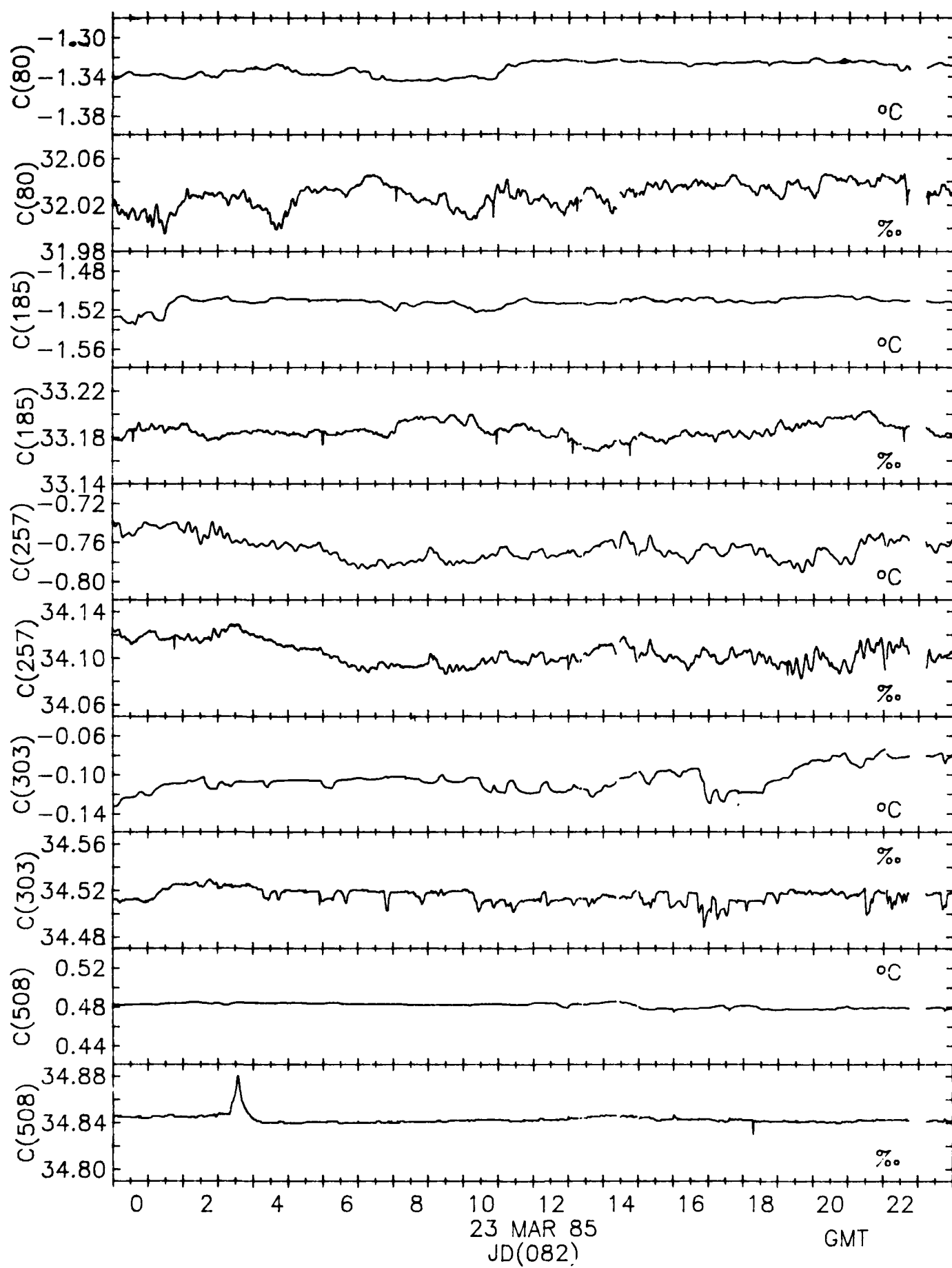


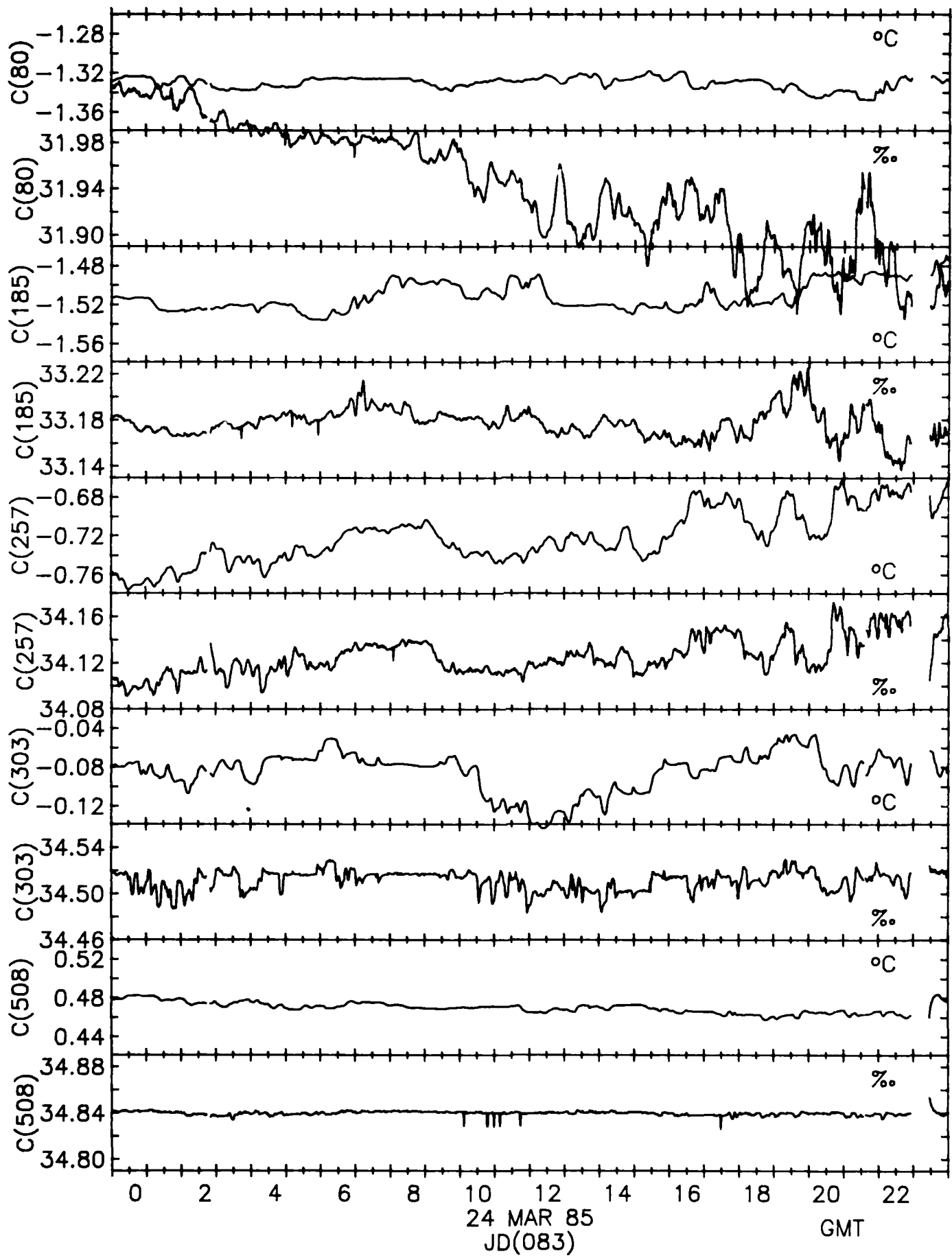
## TIME SERIES OF TEMPERATURE AND SALINITY

The one-minute averages of salinity and filtered temperature are plotted at one day per page. The temperature was filtered by equation (1) with time constant  $\tau = 4$  minutes to try to match the time constant of the conductivity sensors. The series are plotted with the same resolution of temperature, conductivity and depth.

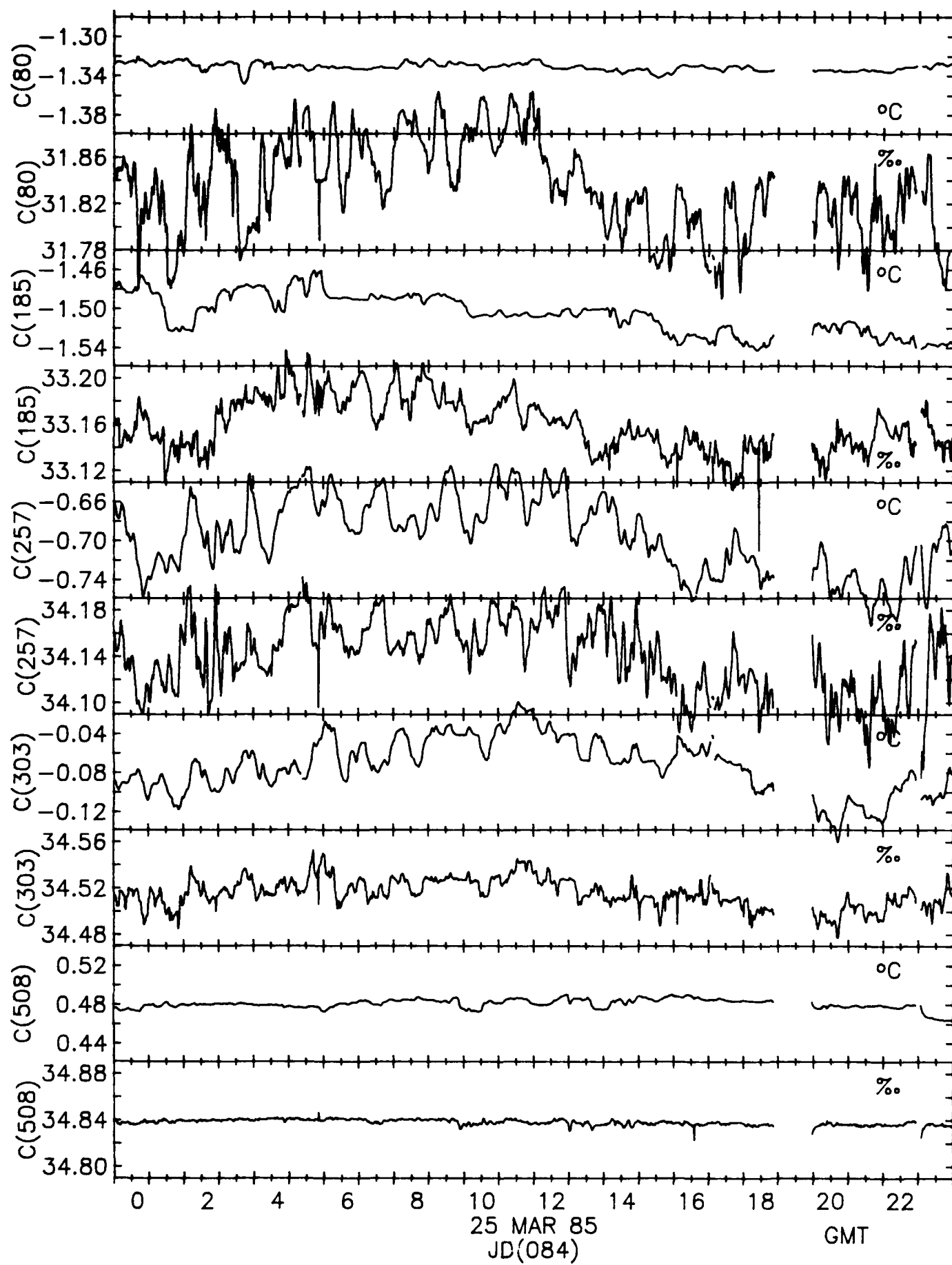
PREVIOUS PAGE  
IS BLANK

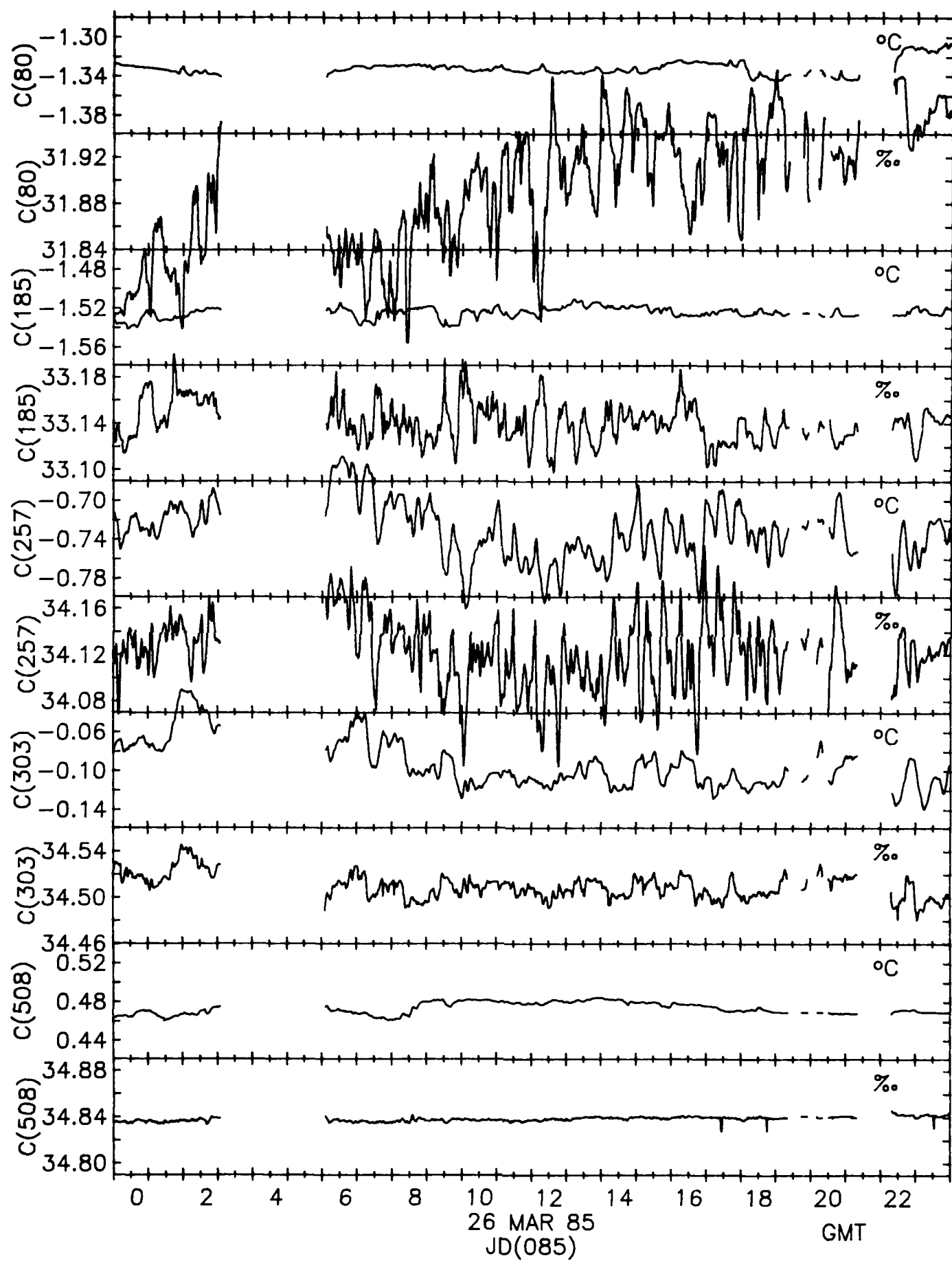


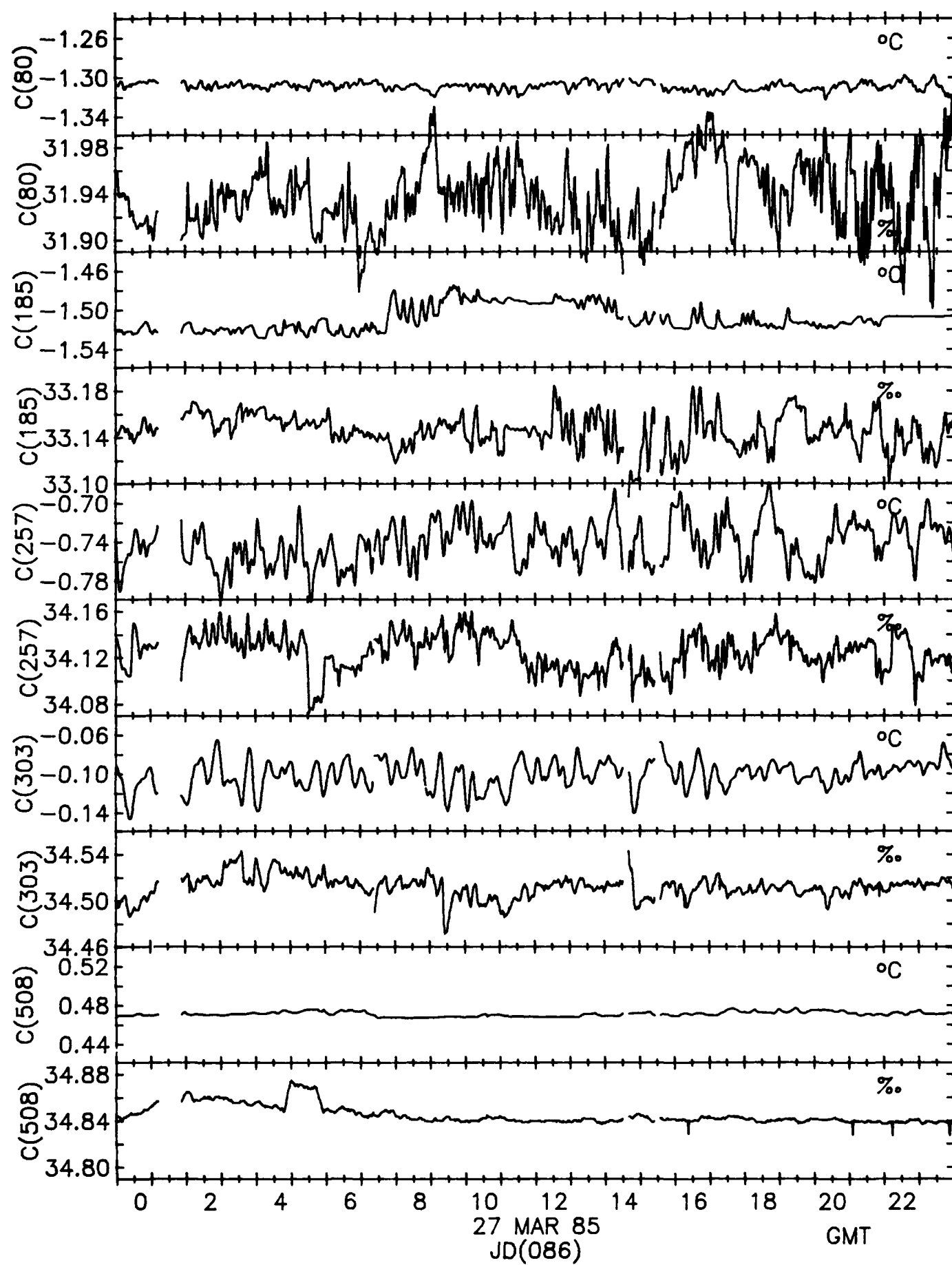


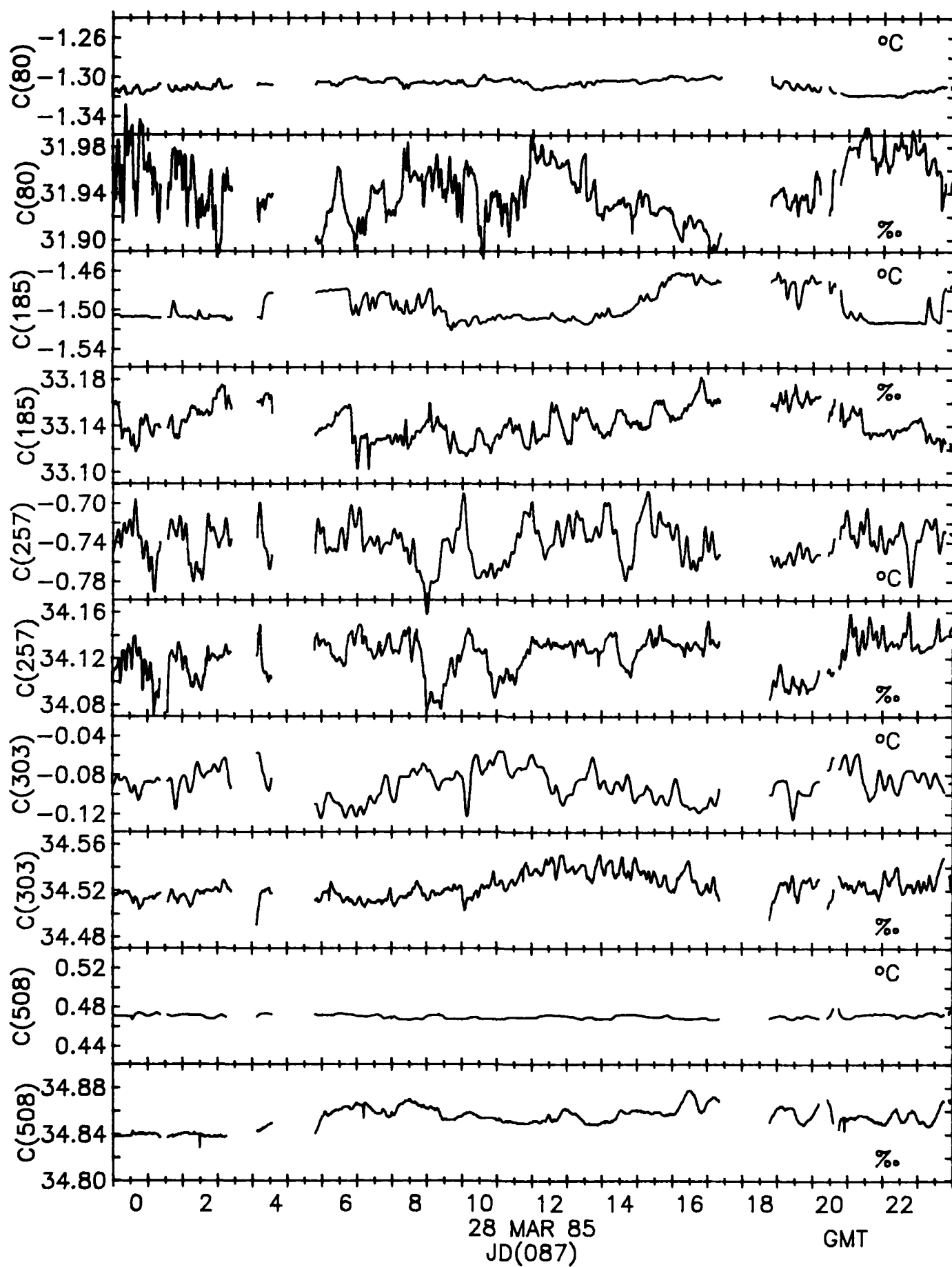


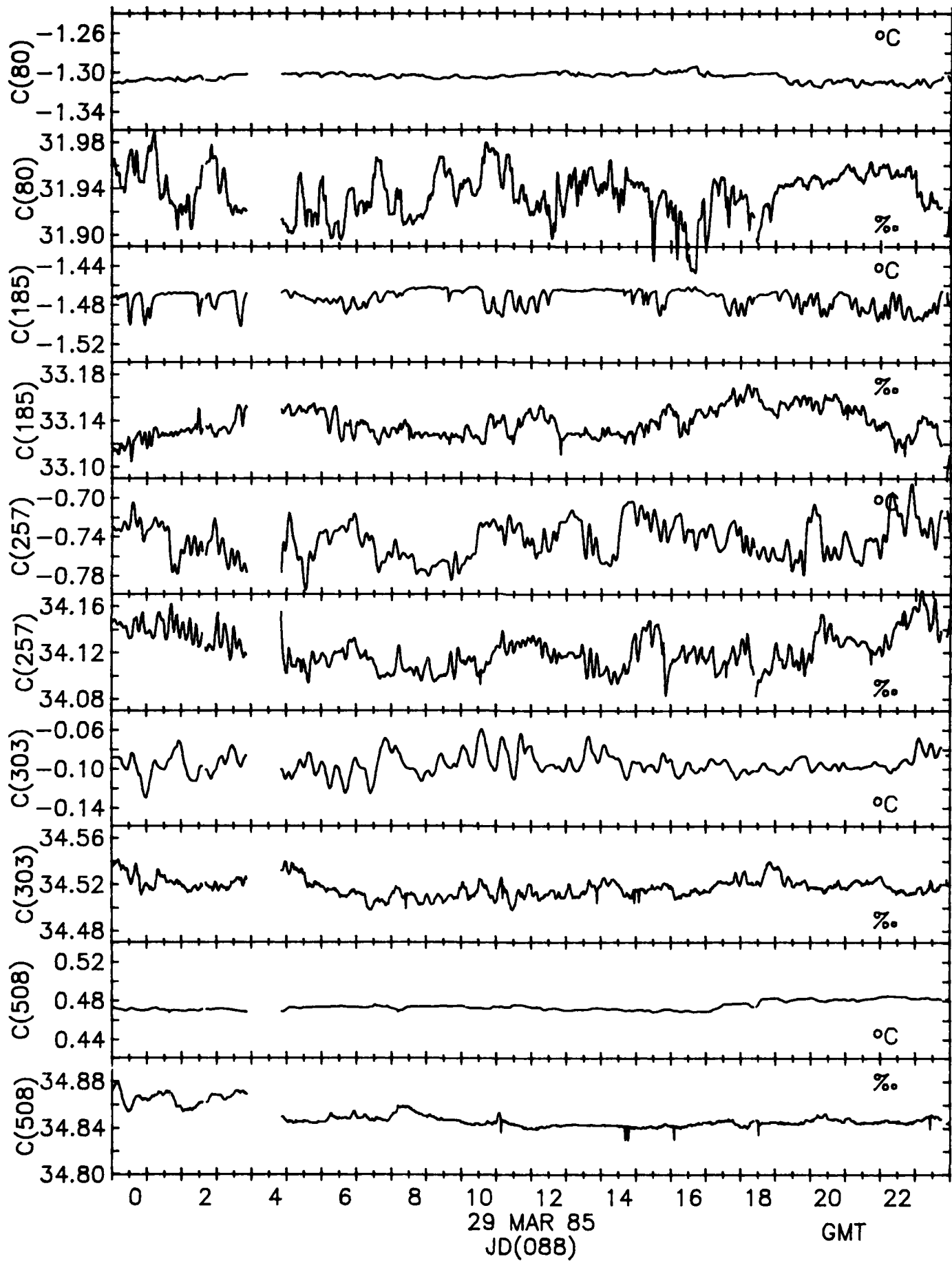


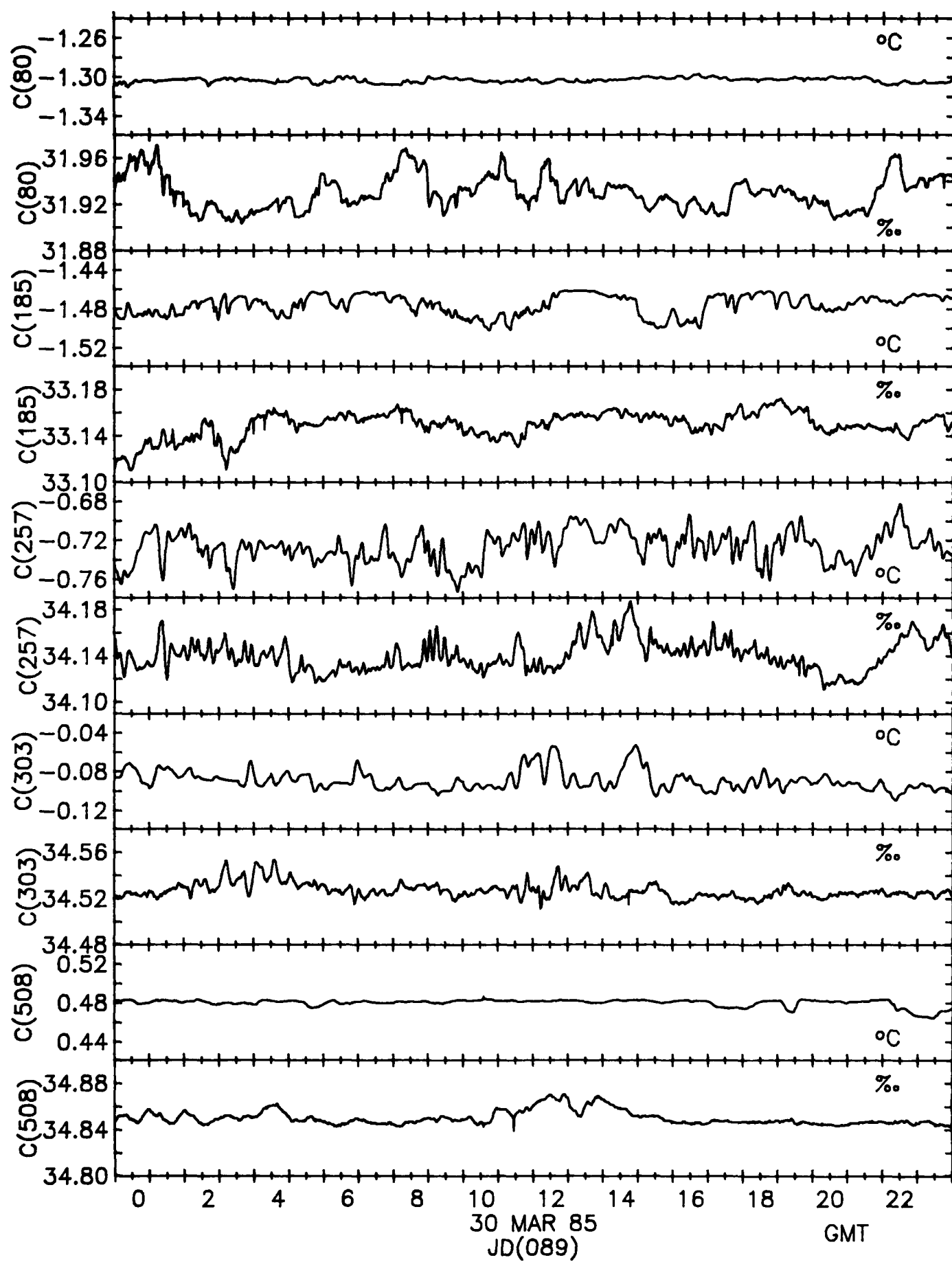


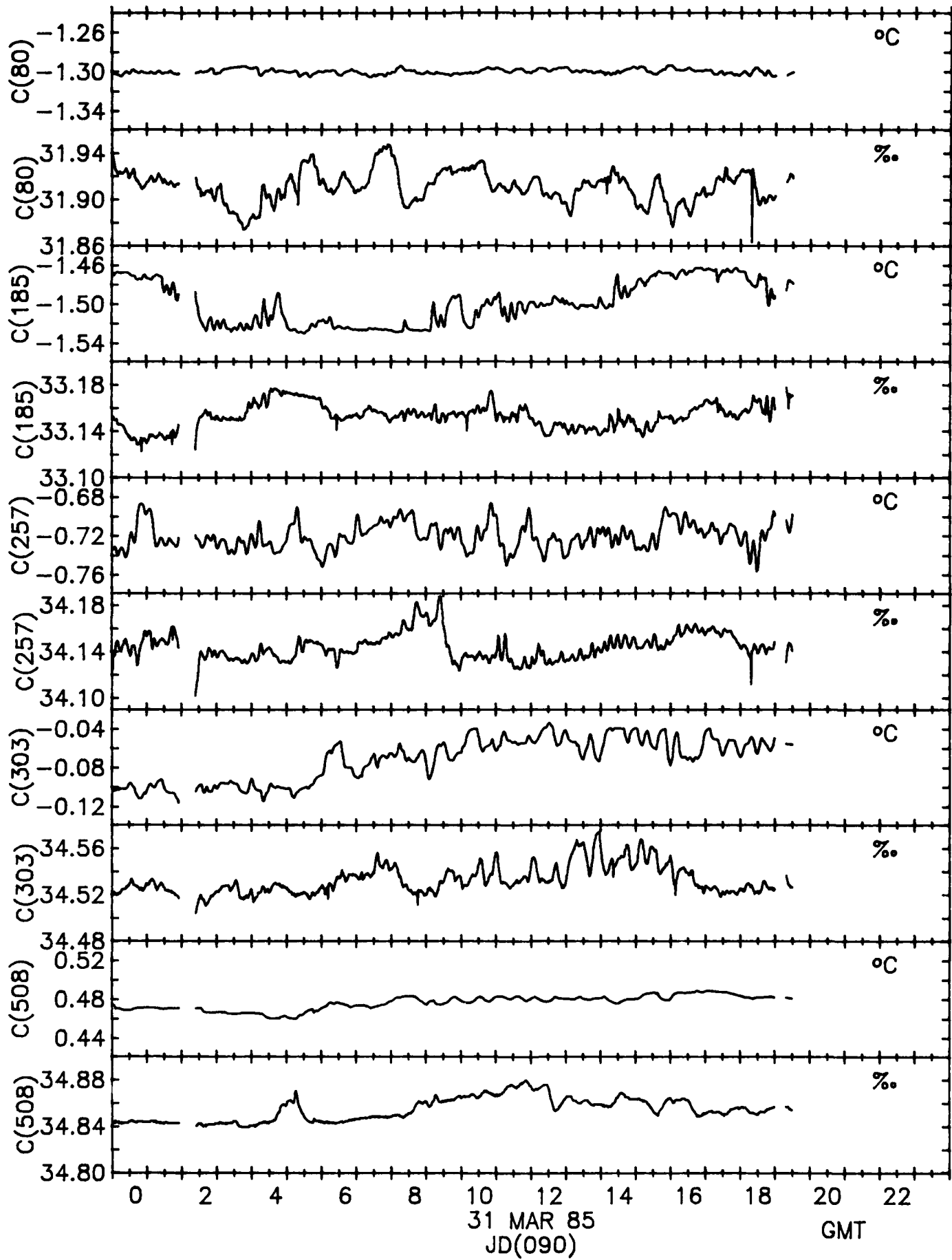


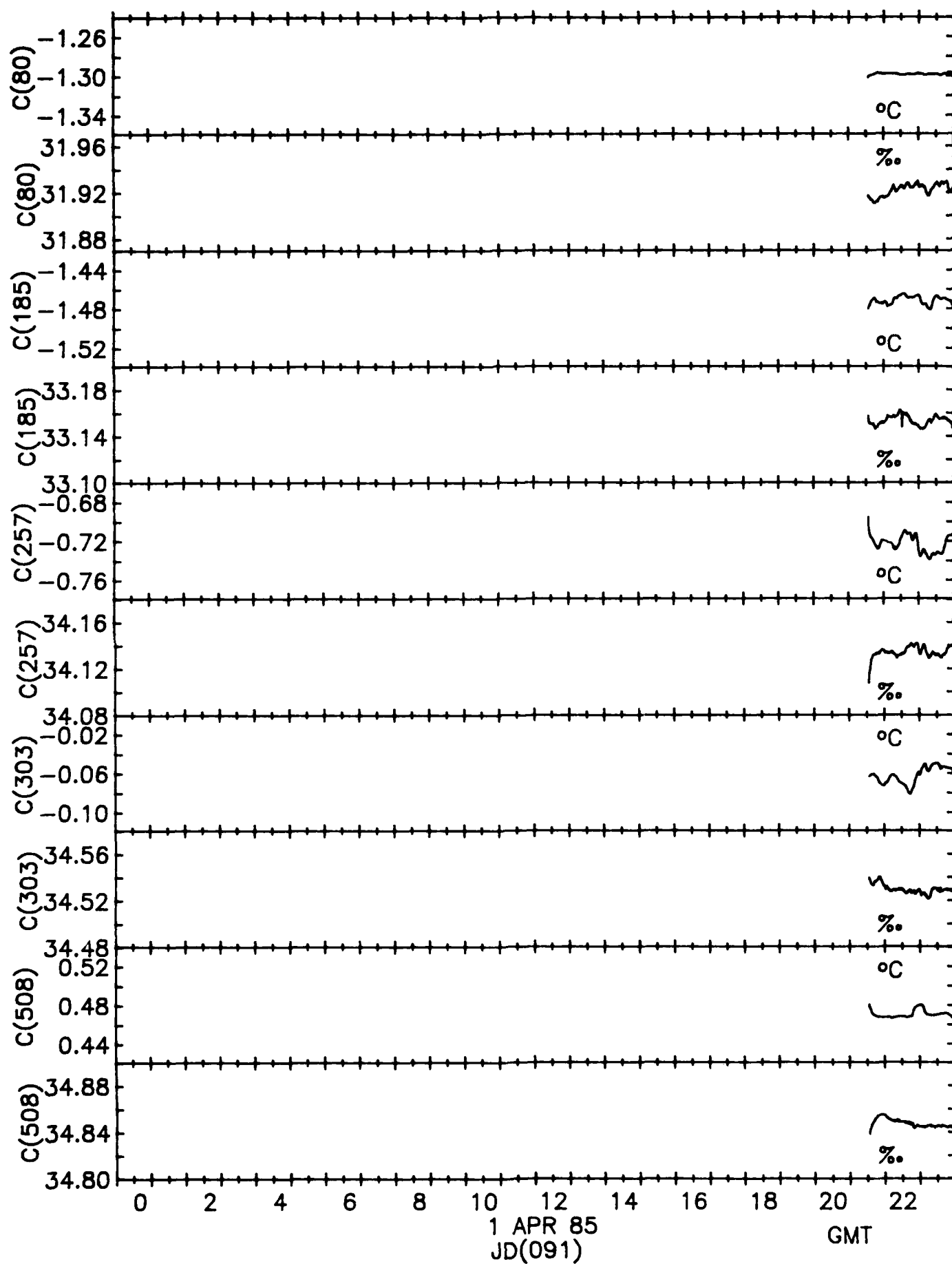




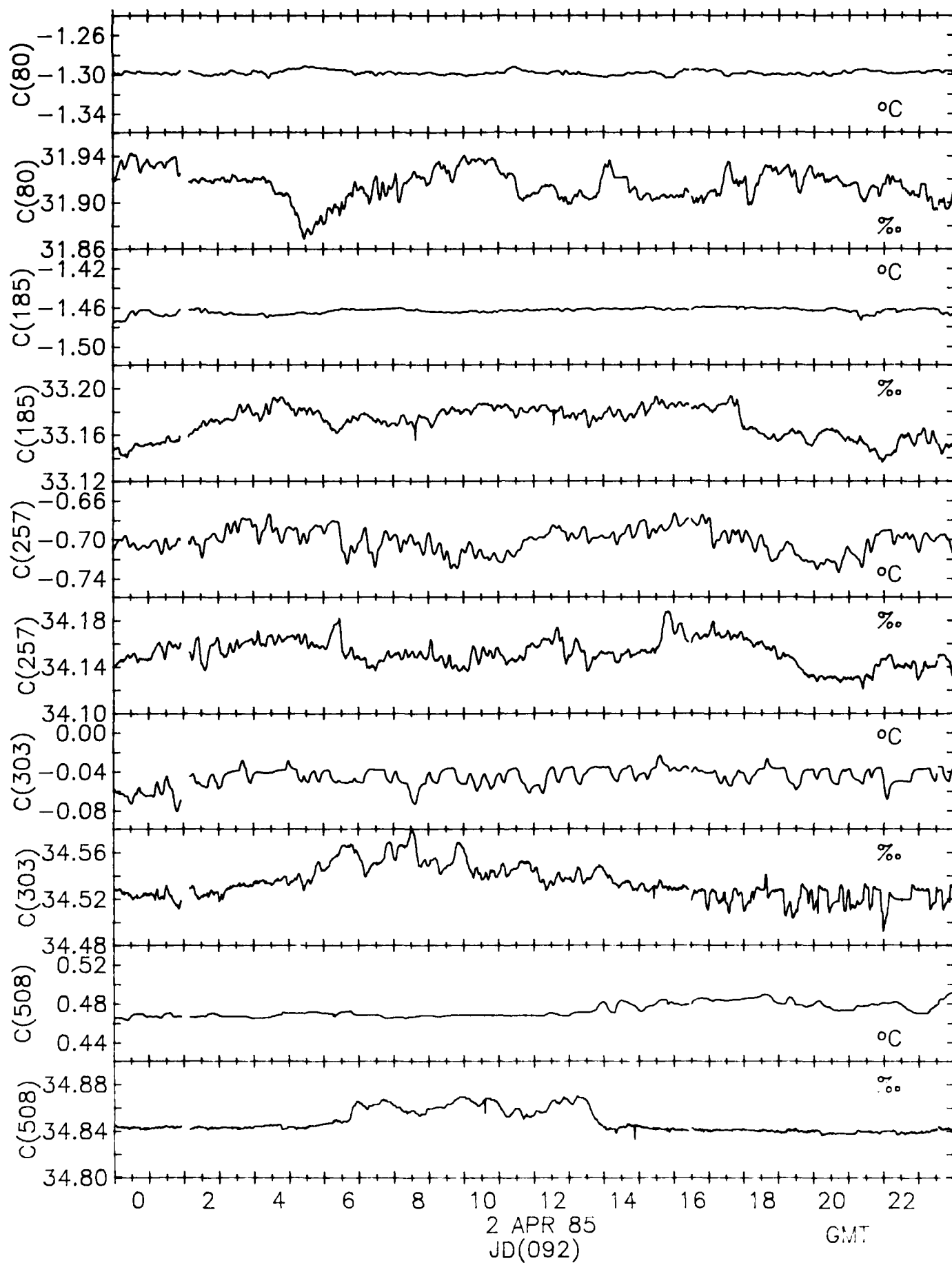


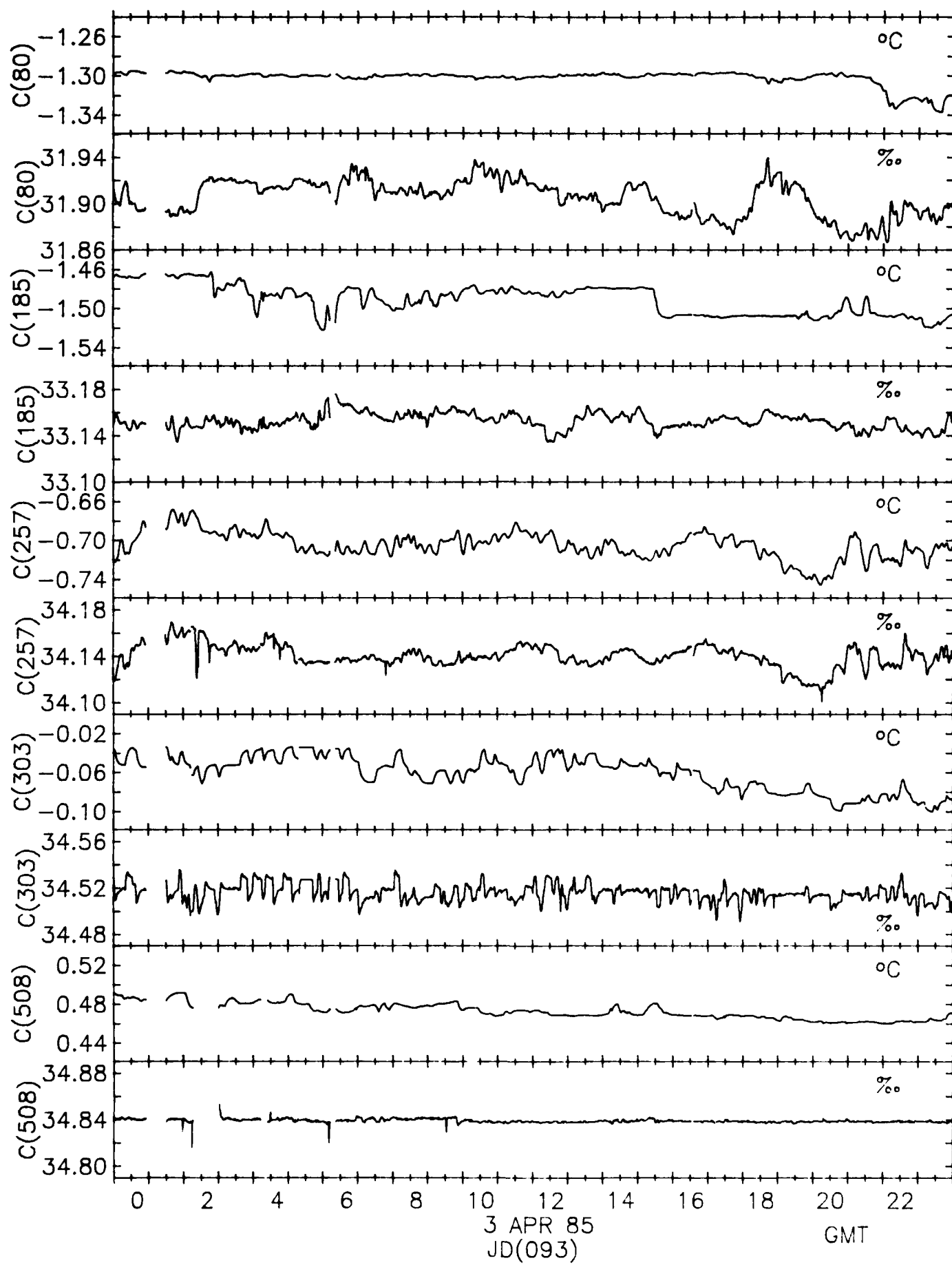


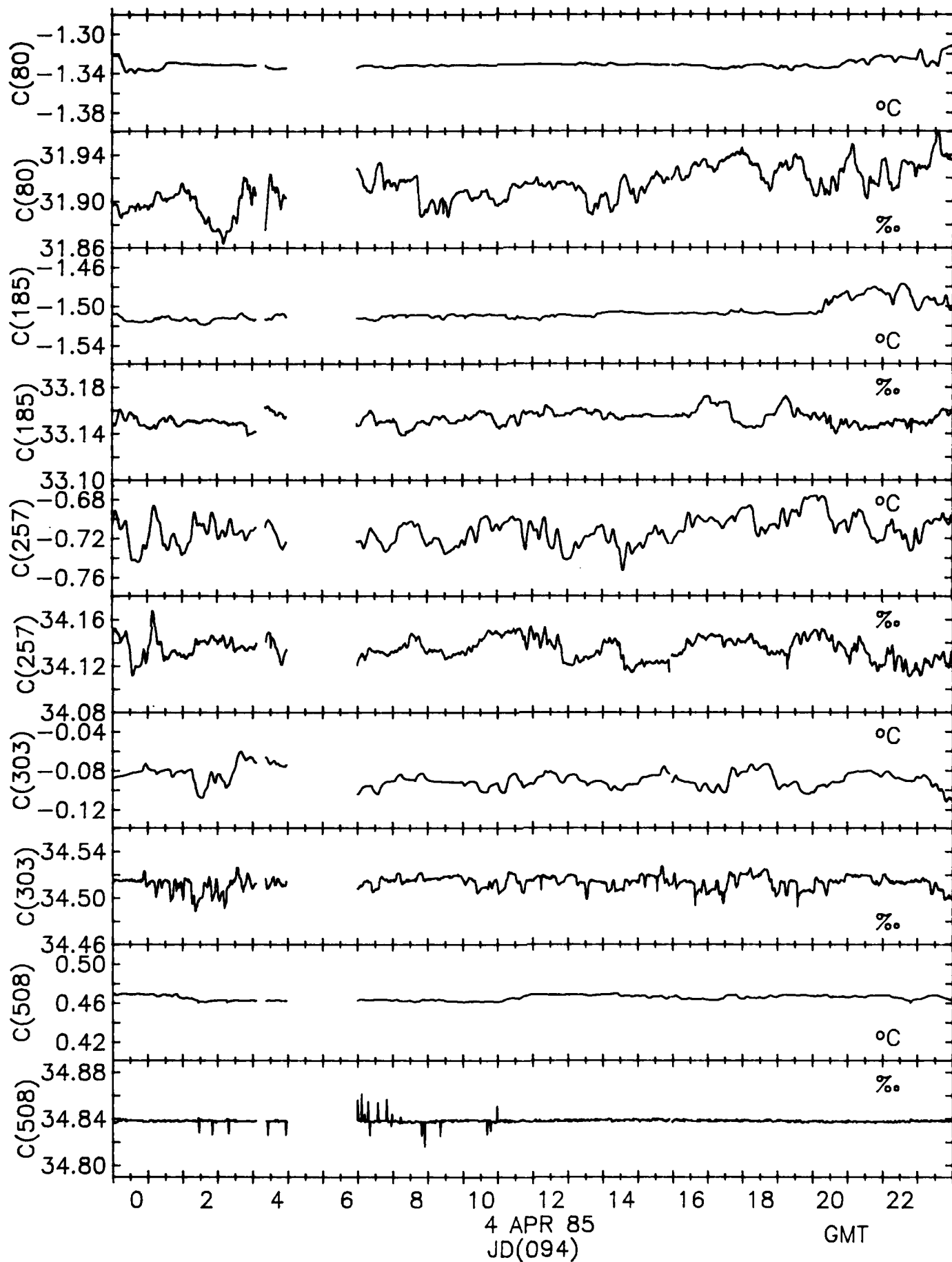


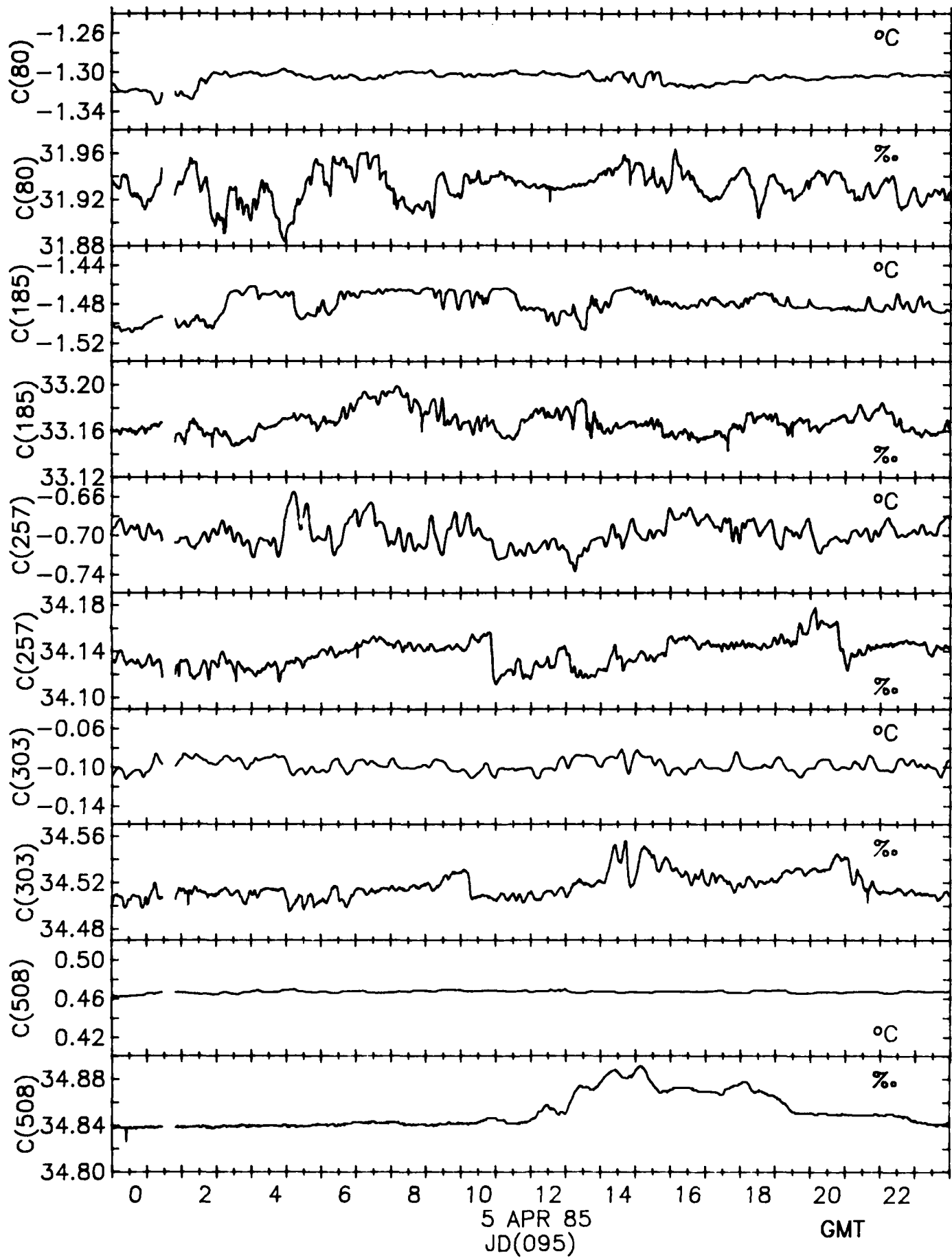


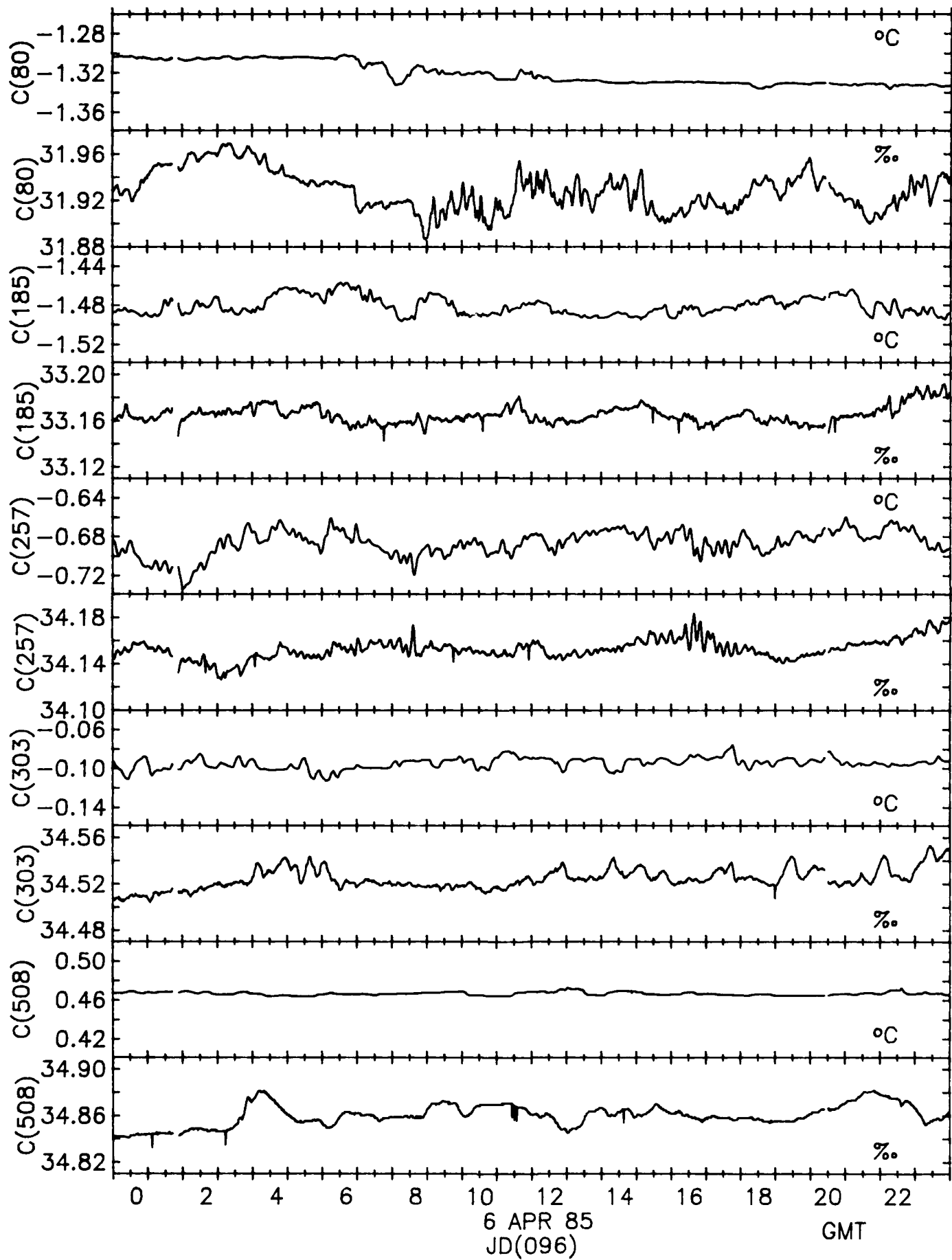


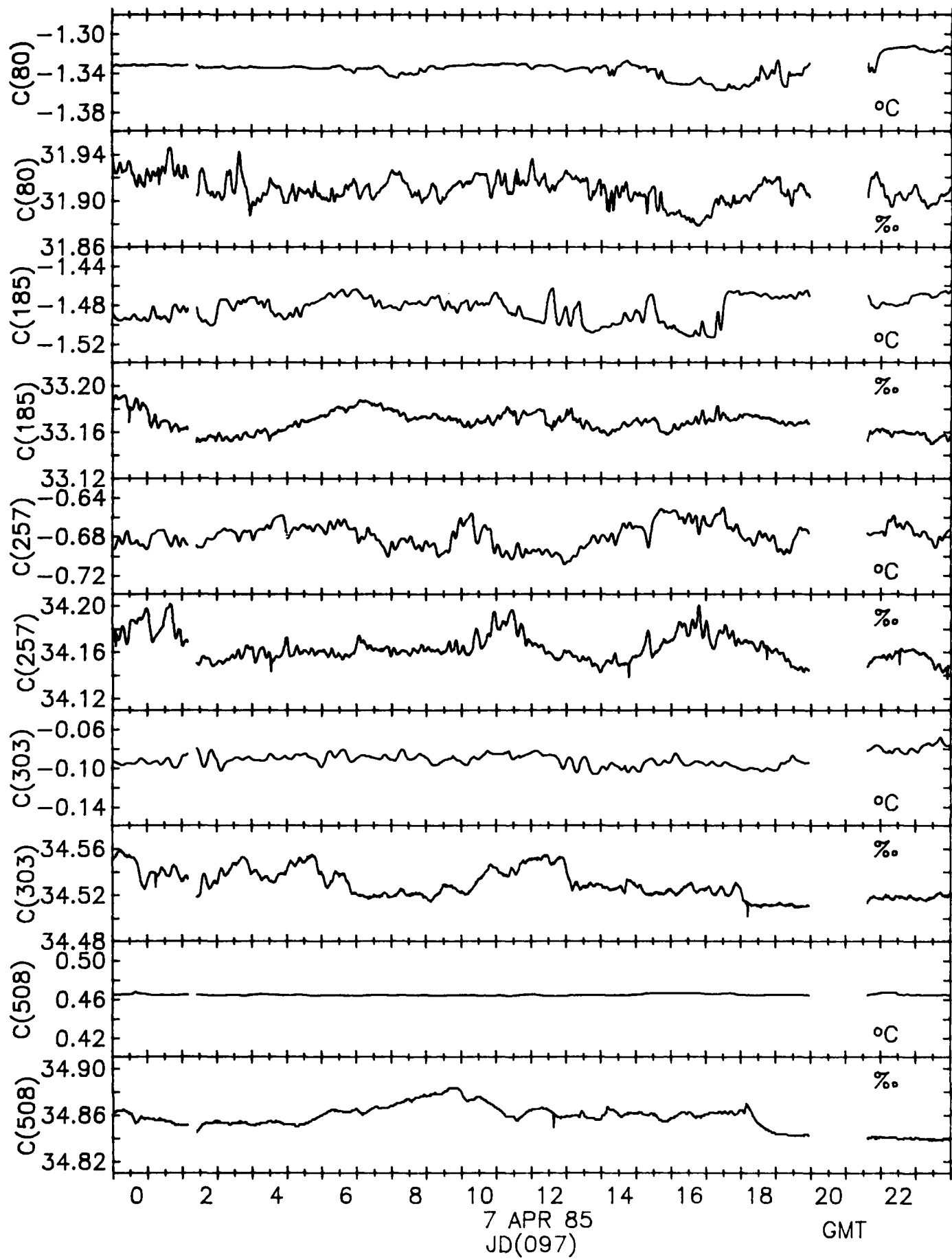


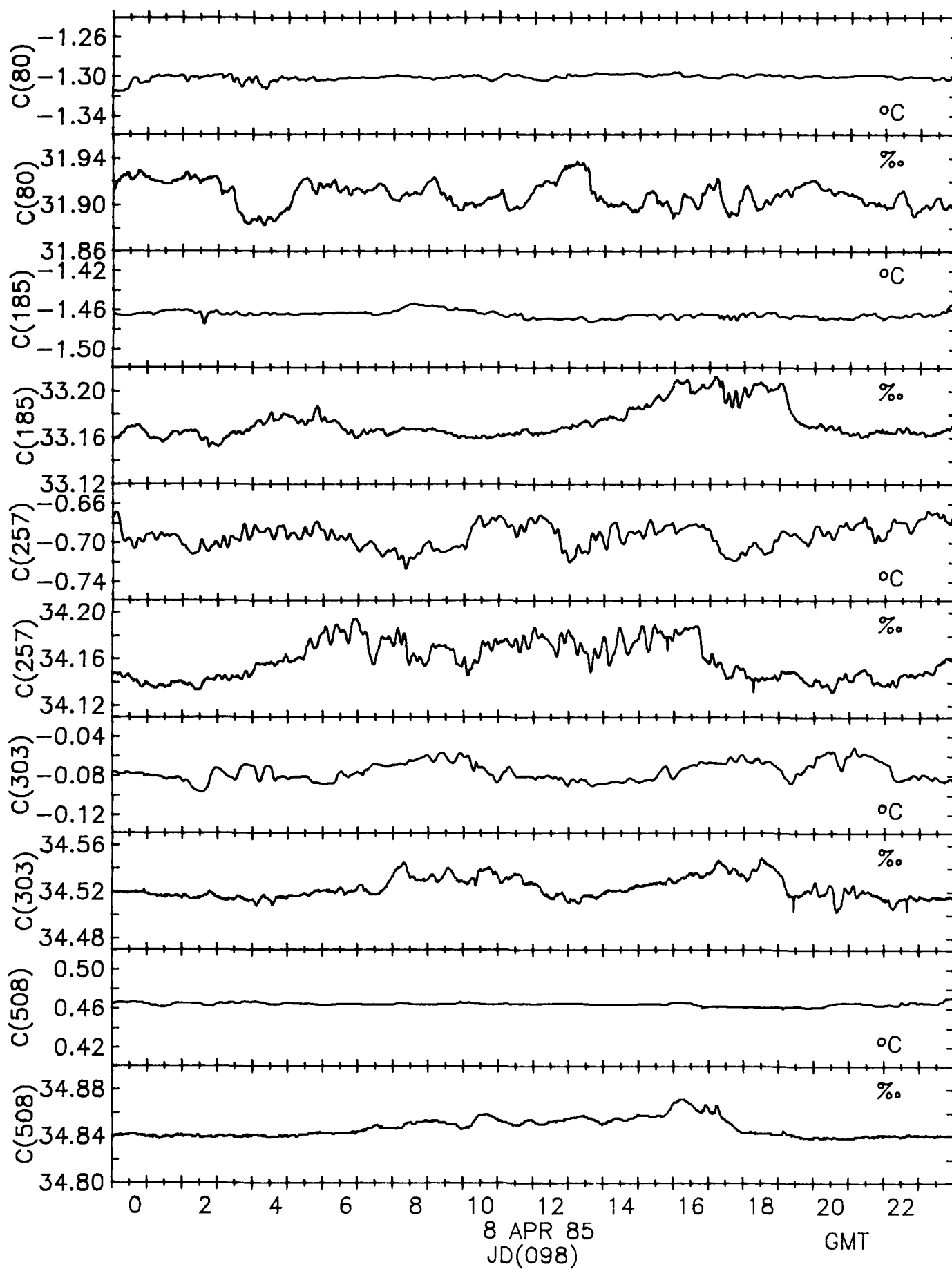


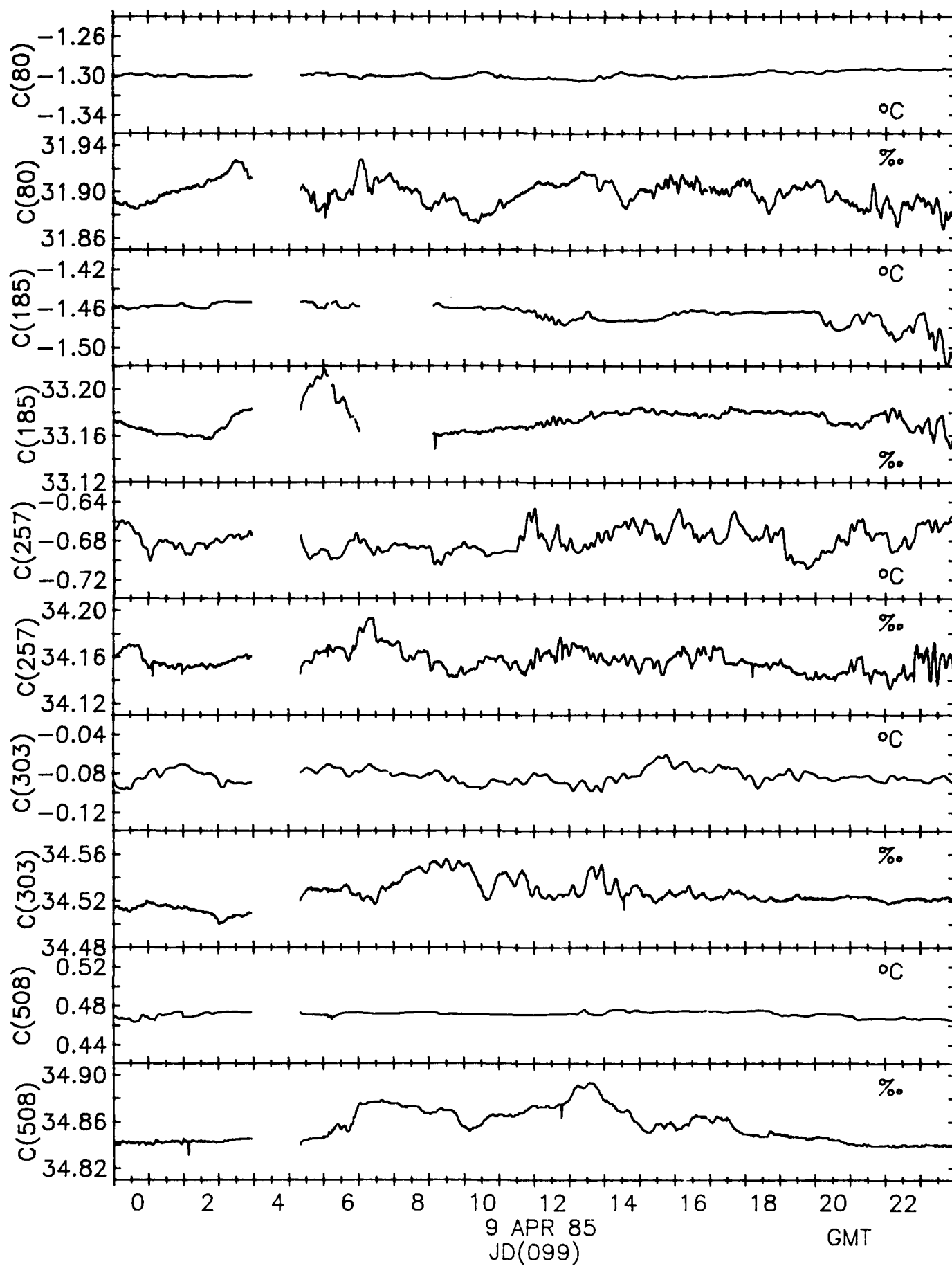




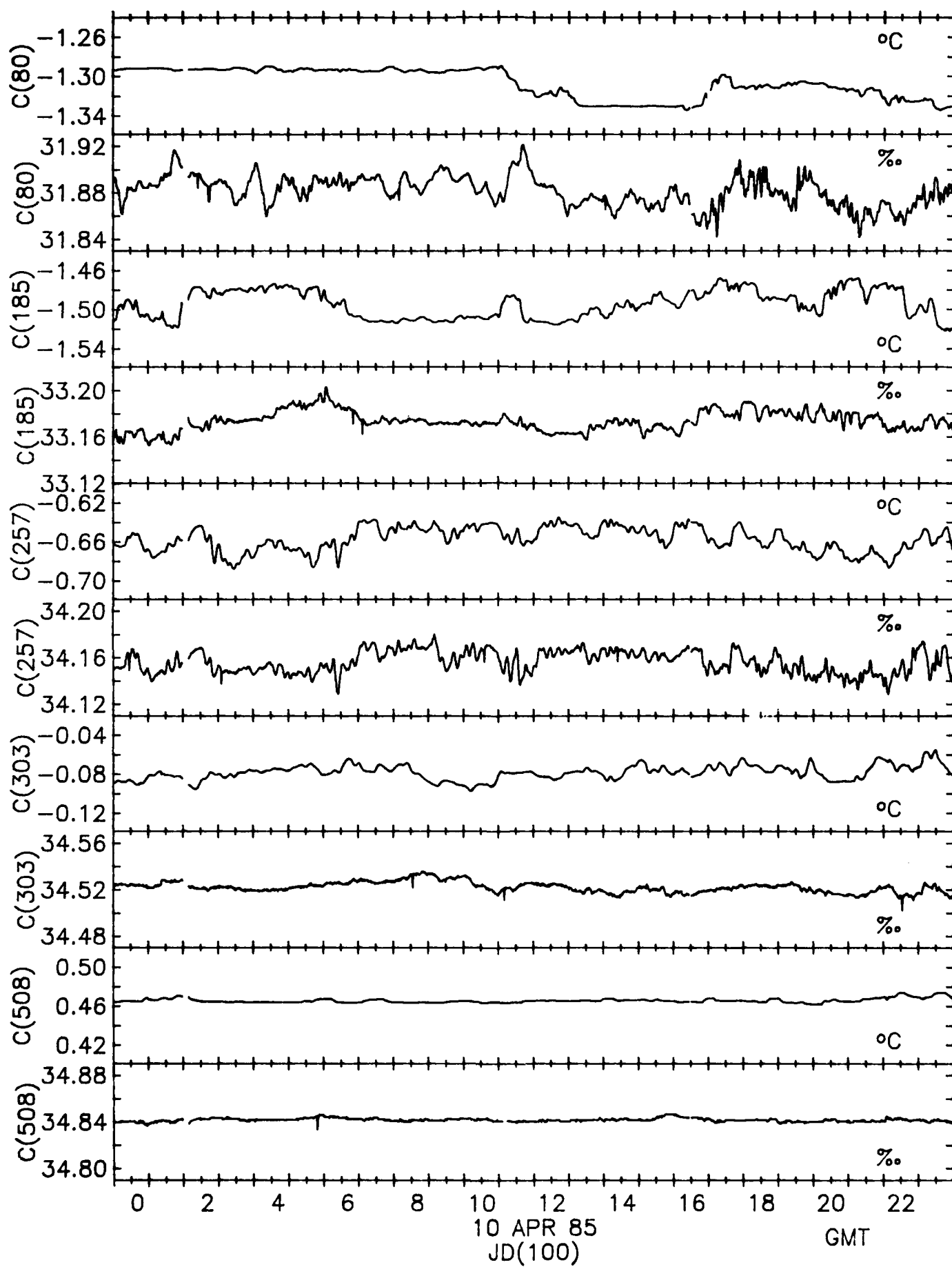


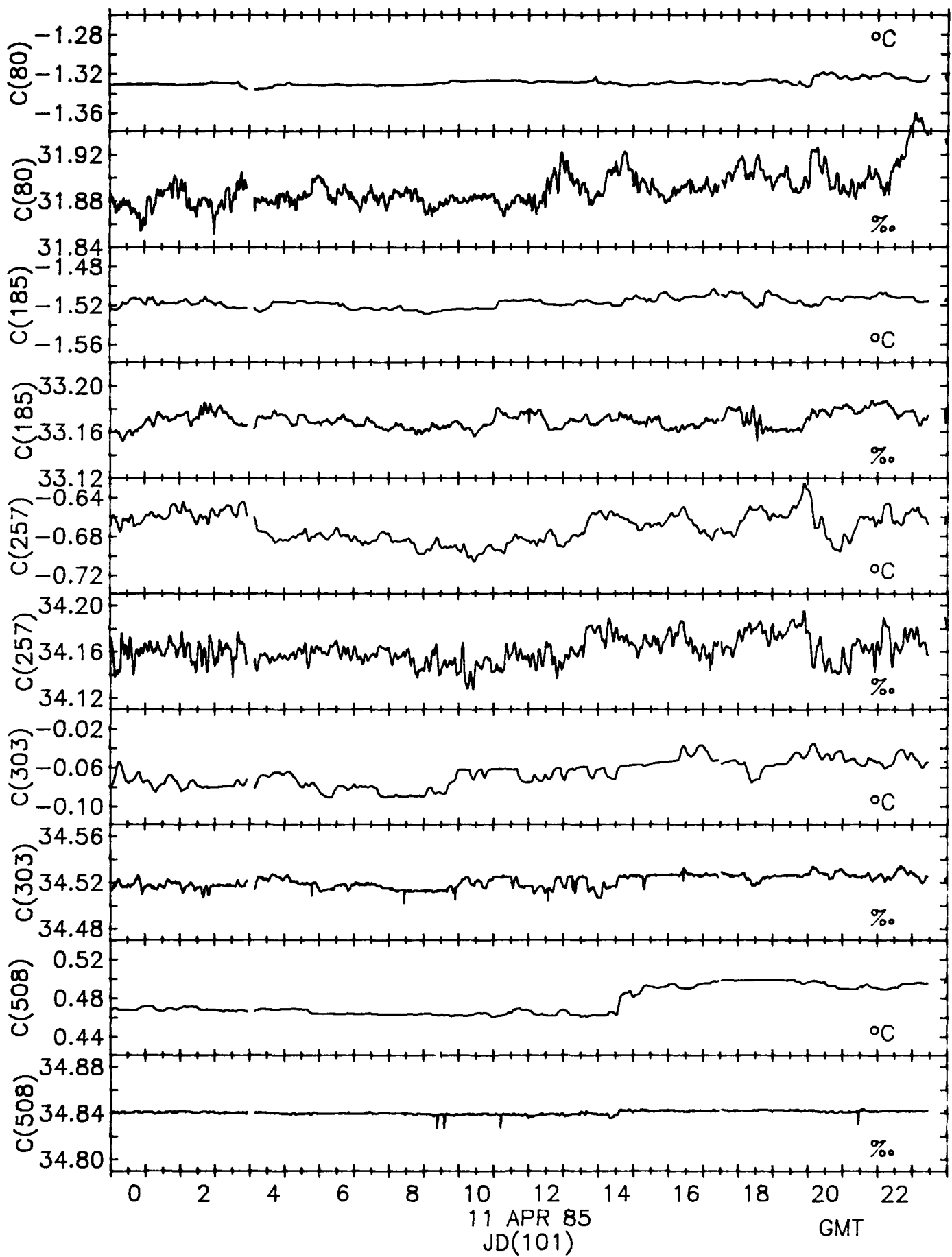


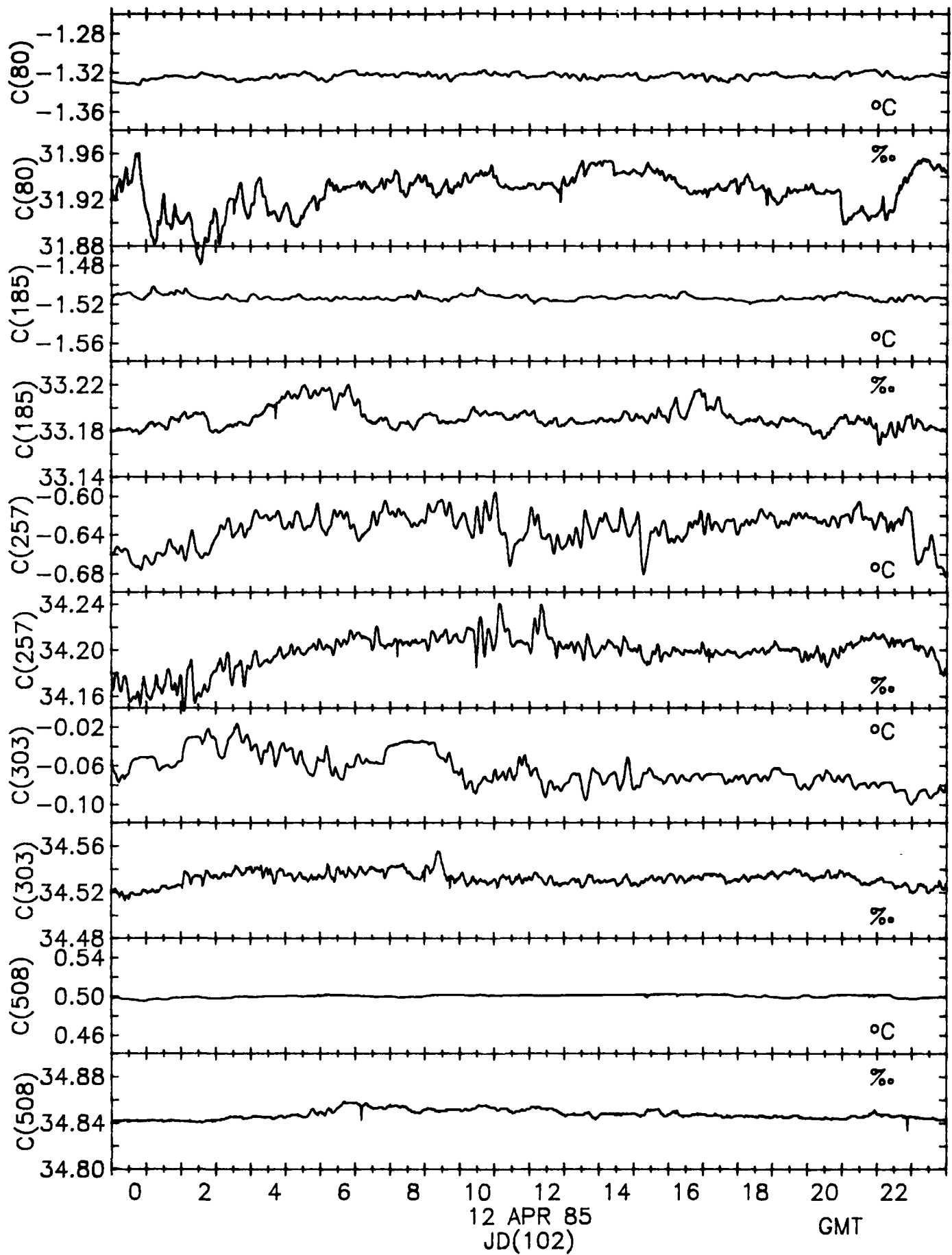


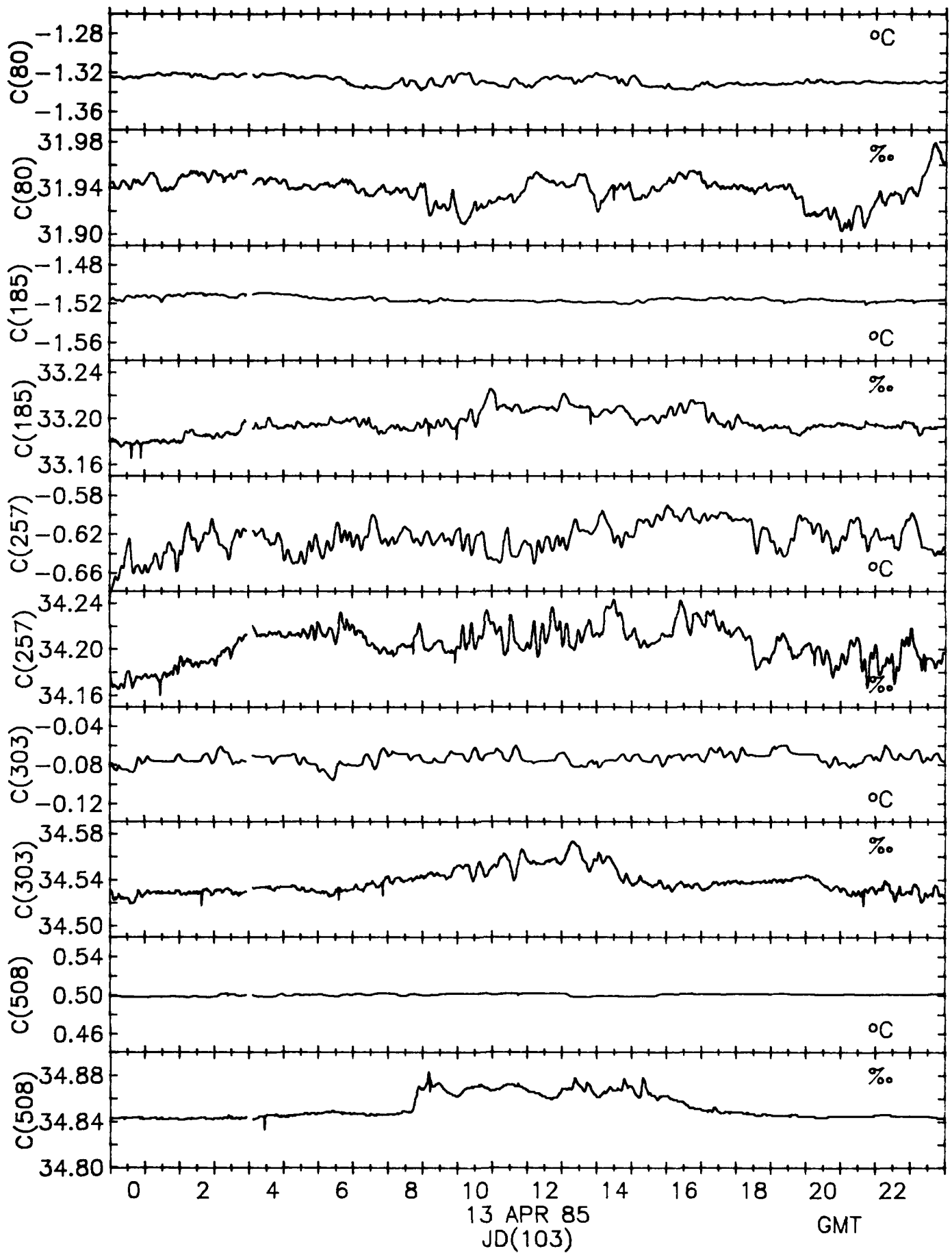


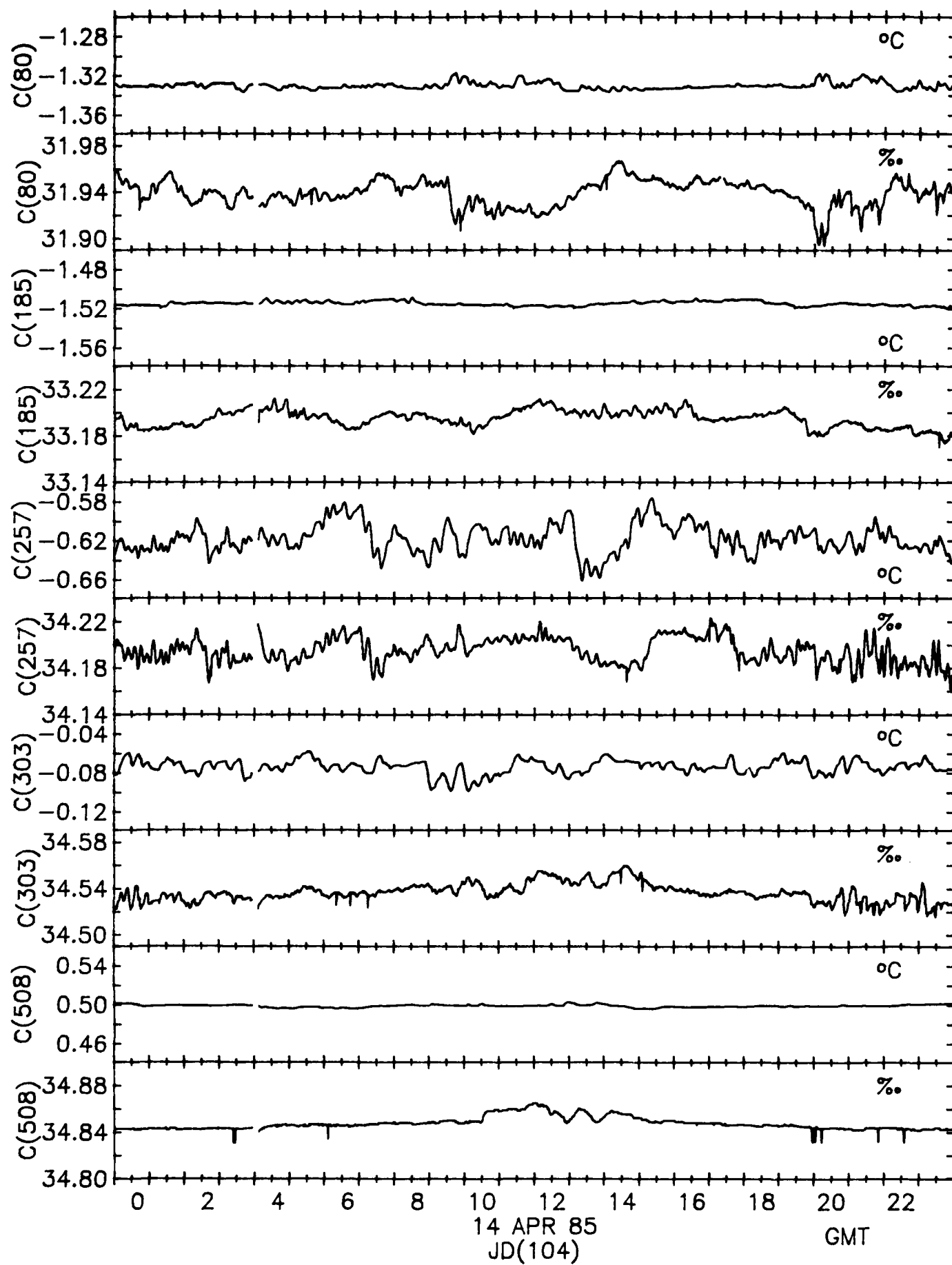


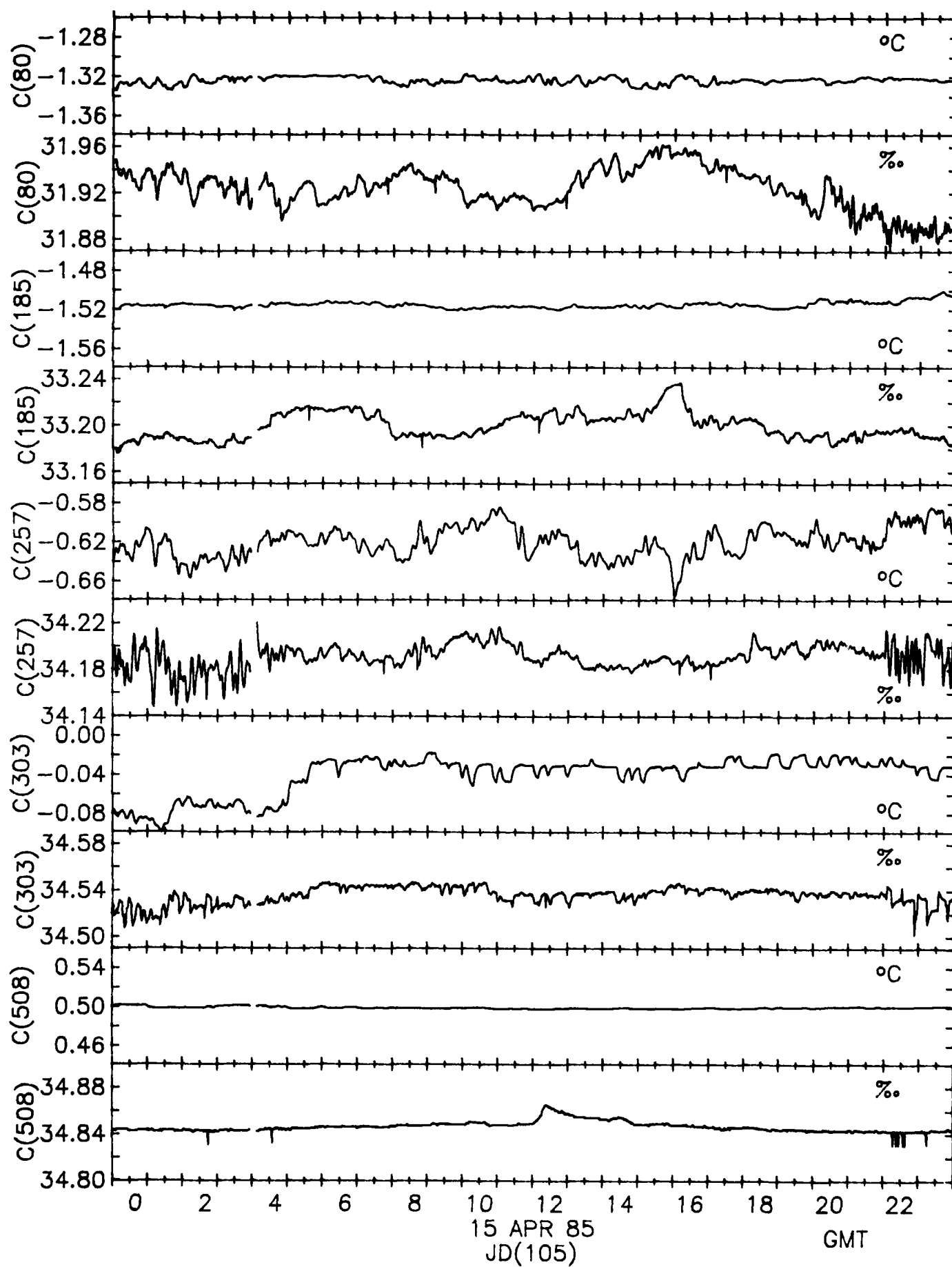


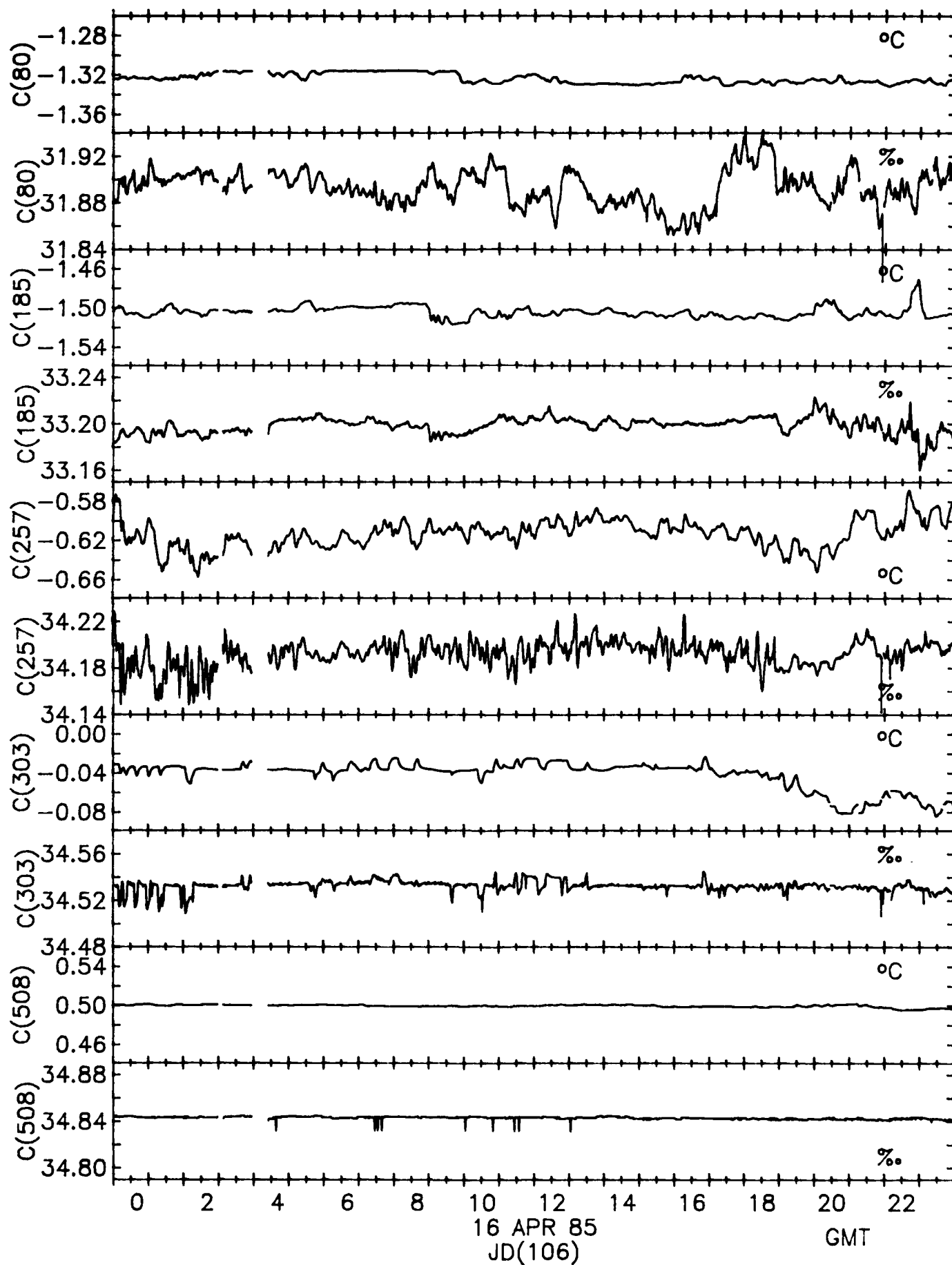


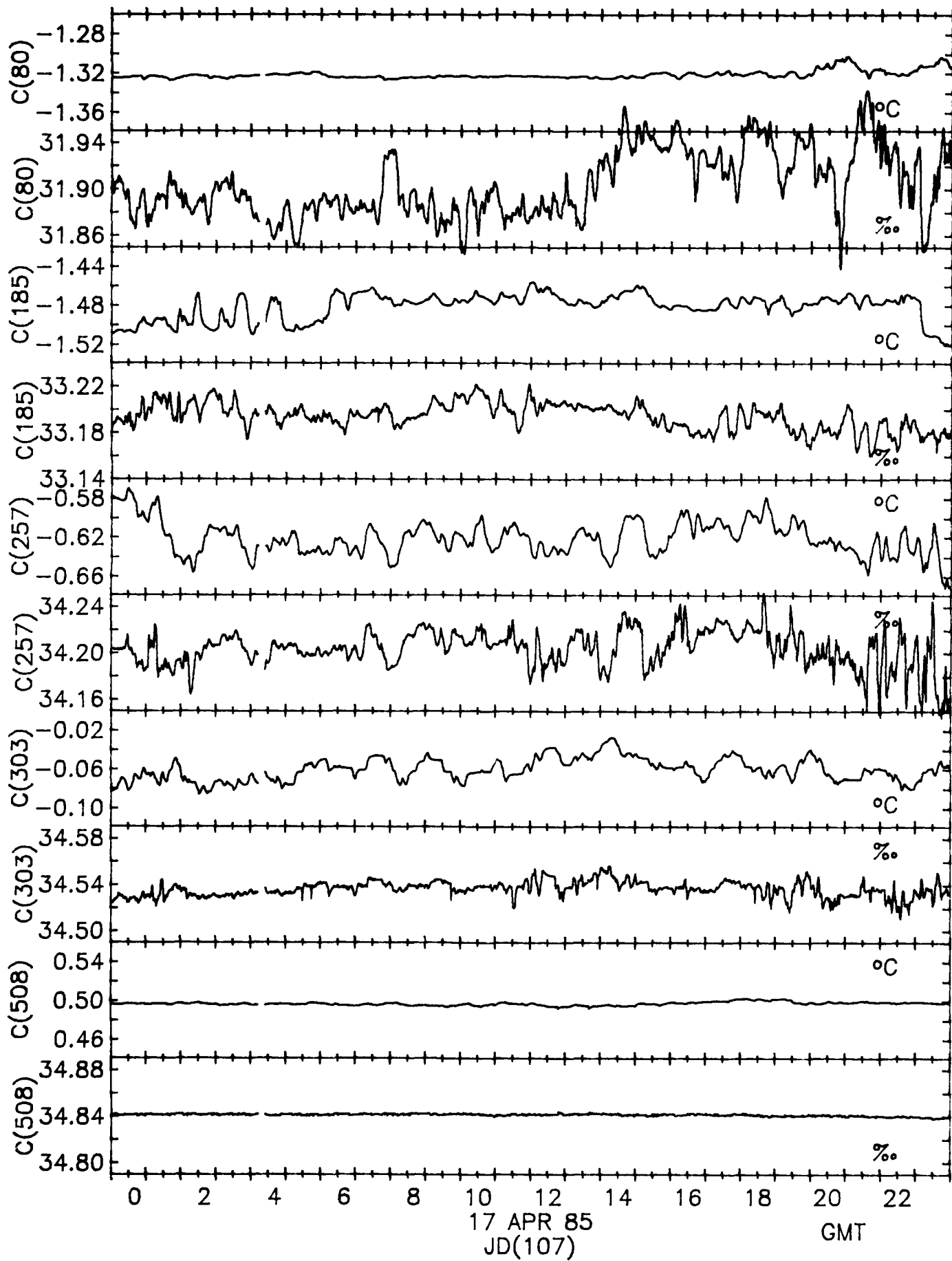




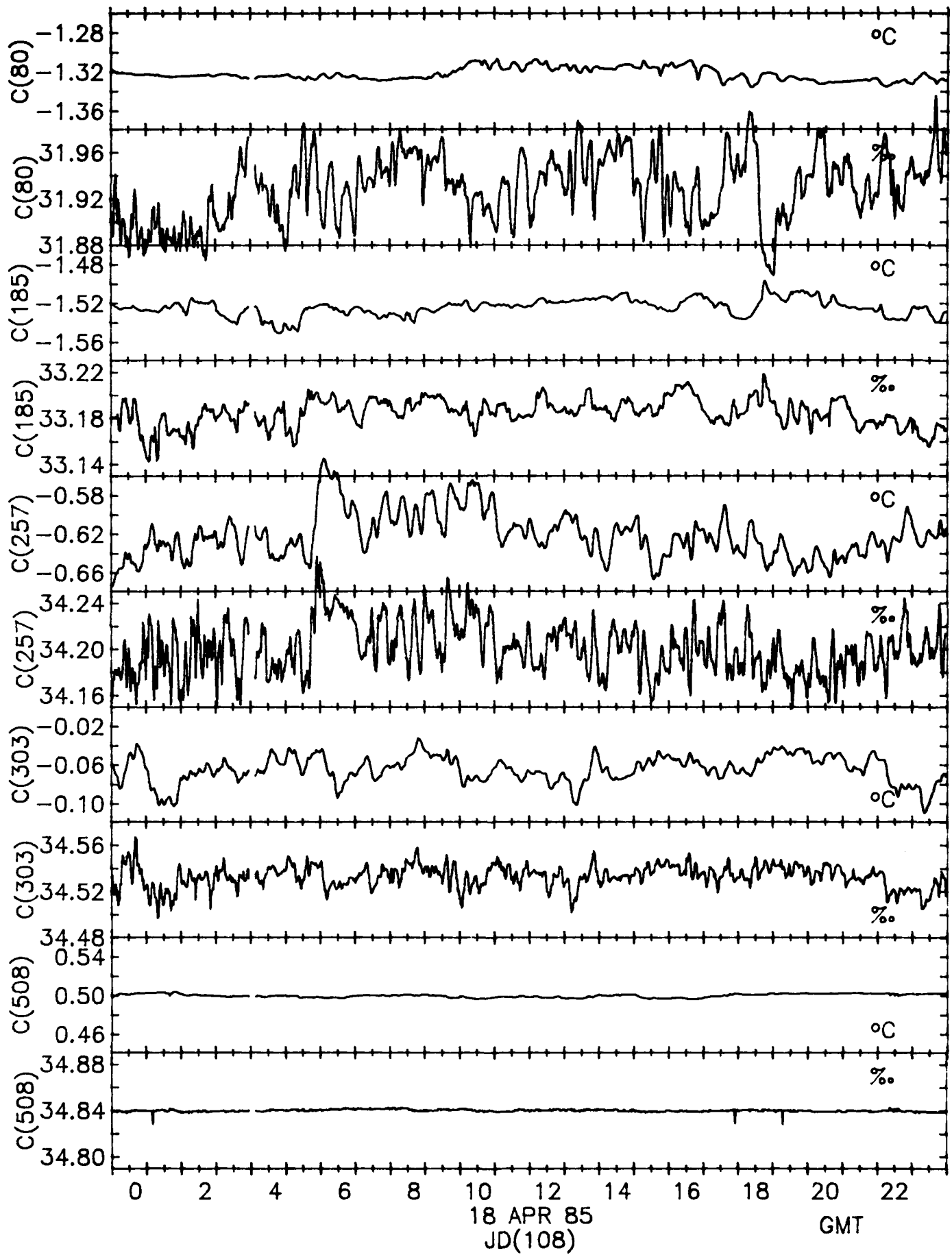


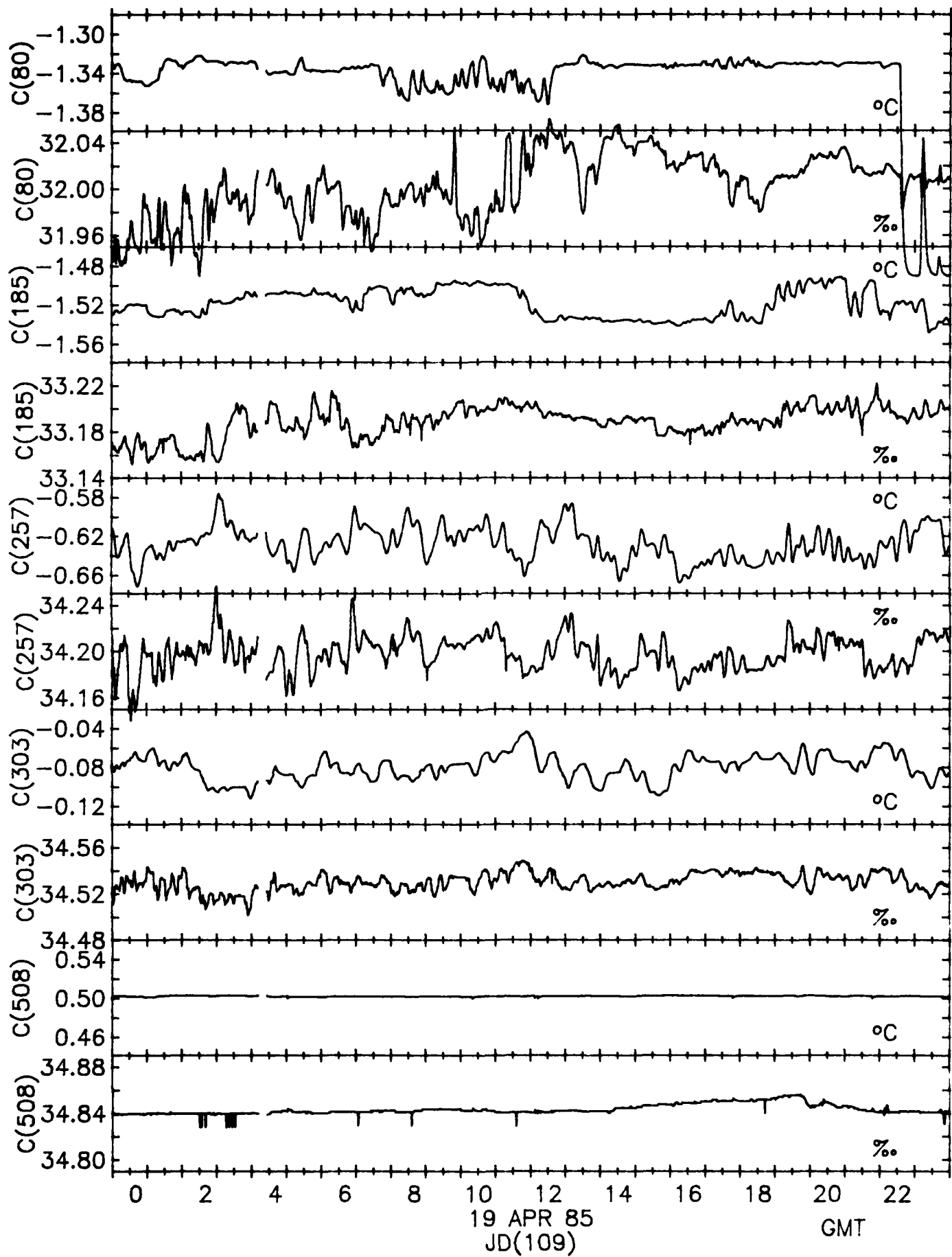


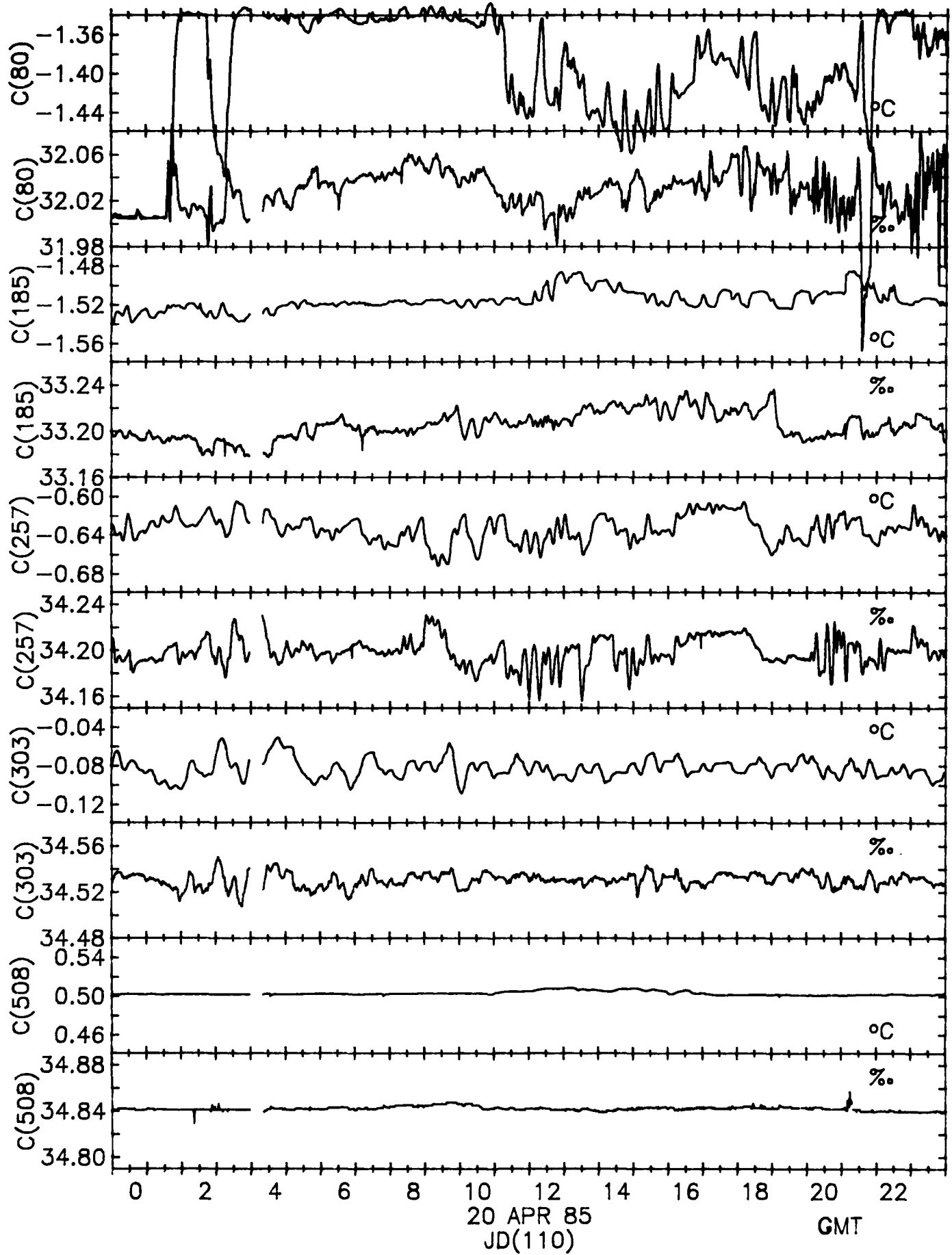


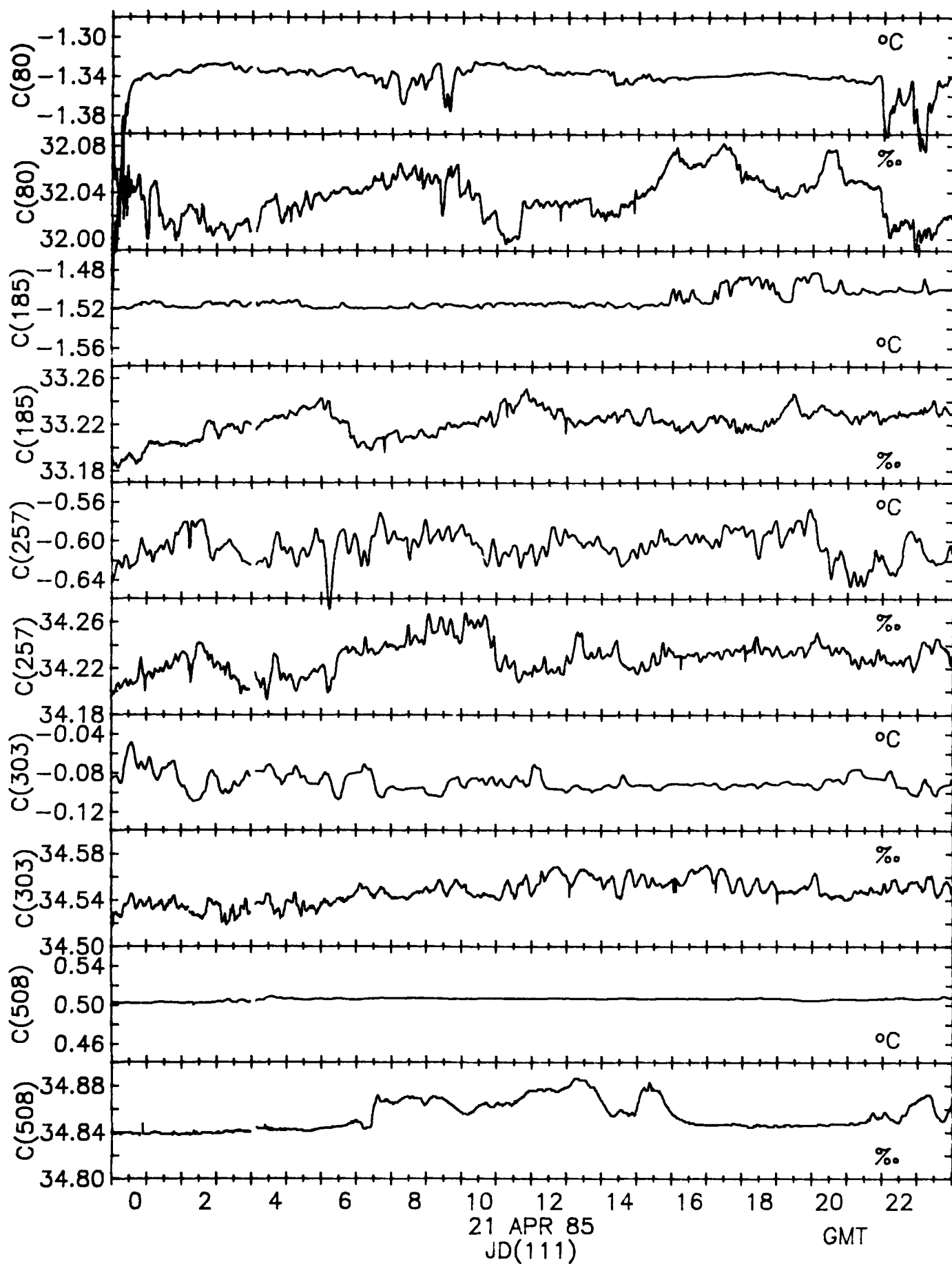


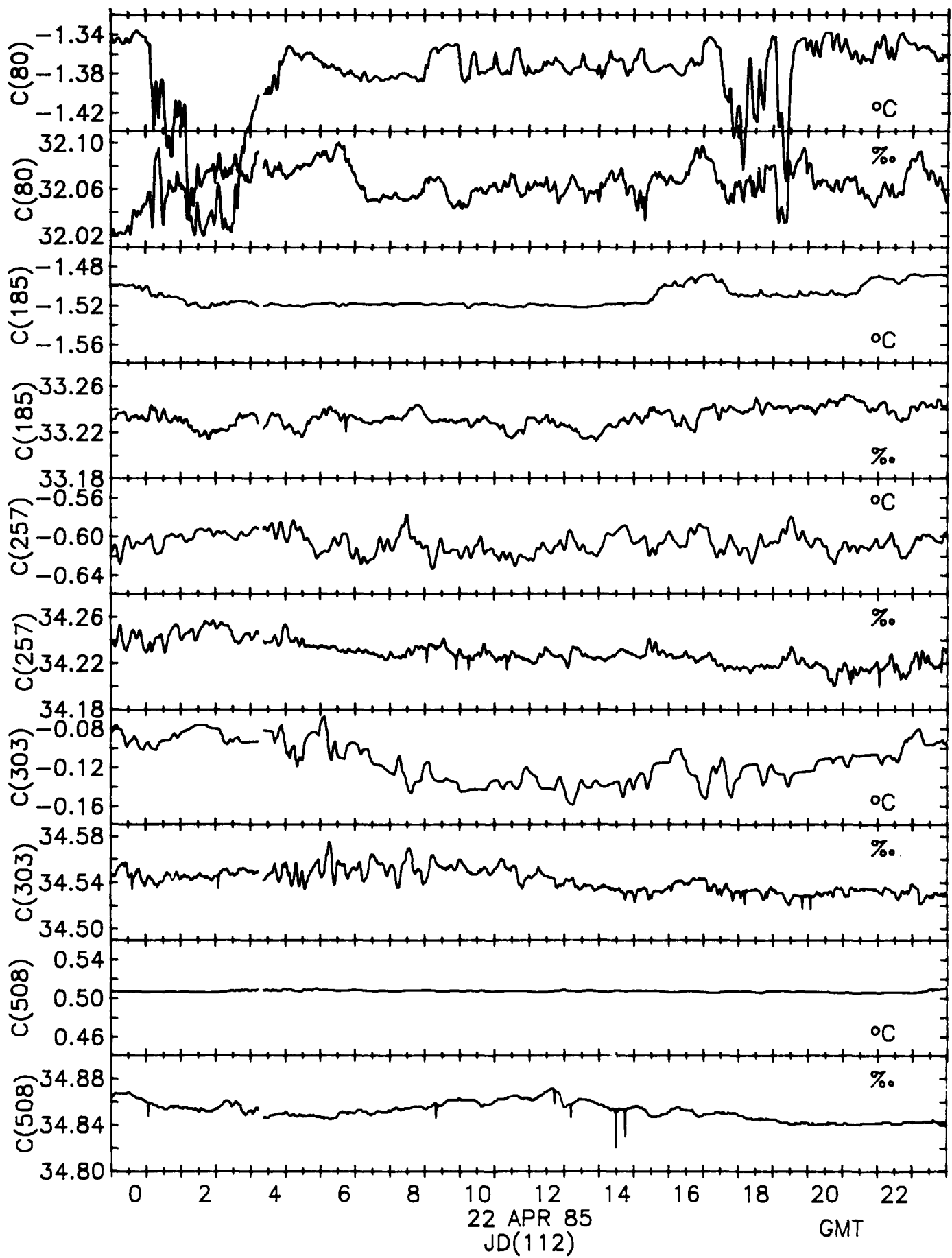


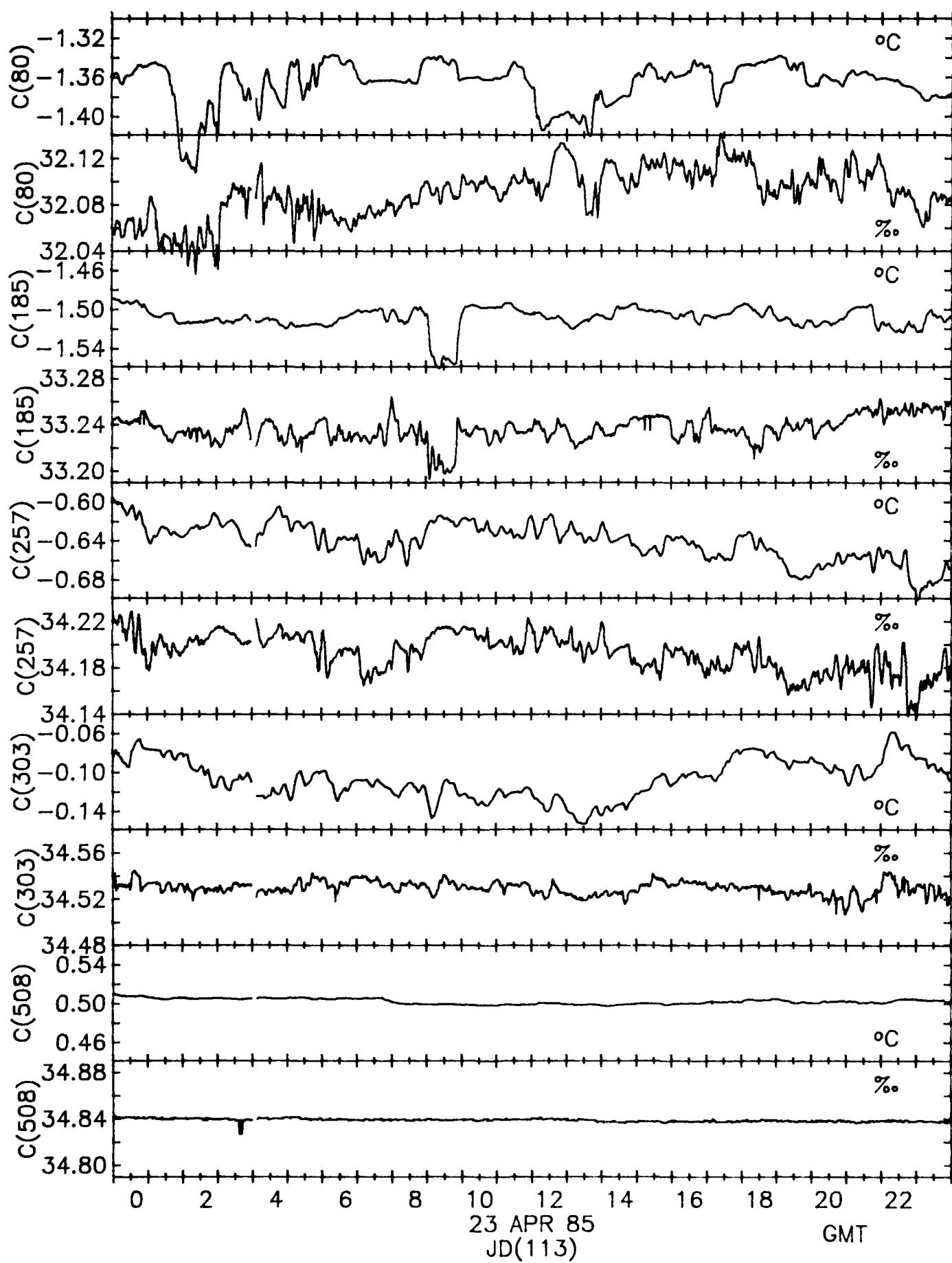


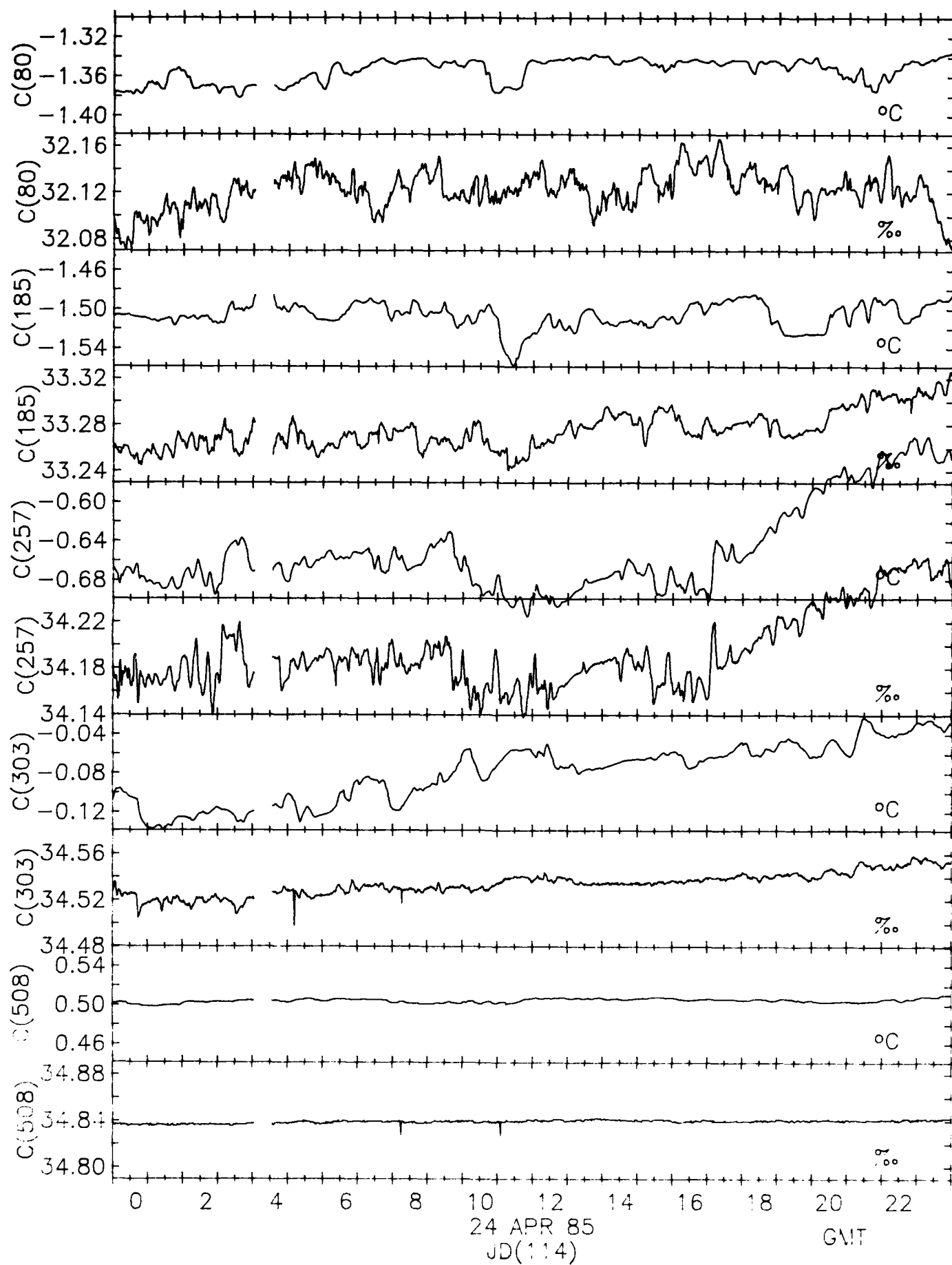


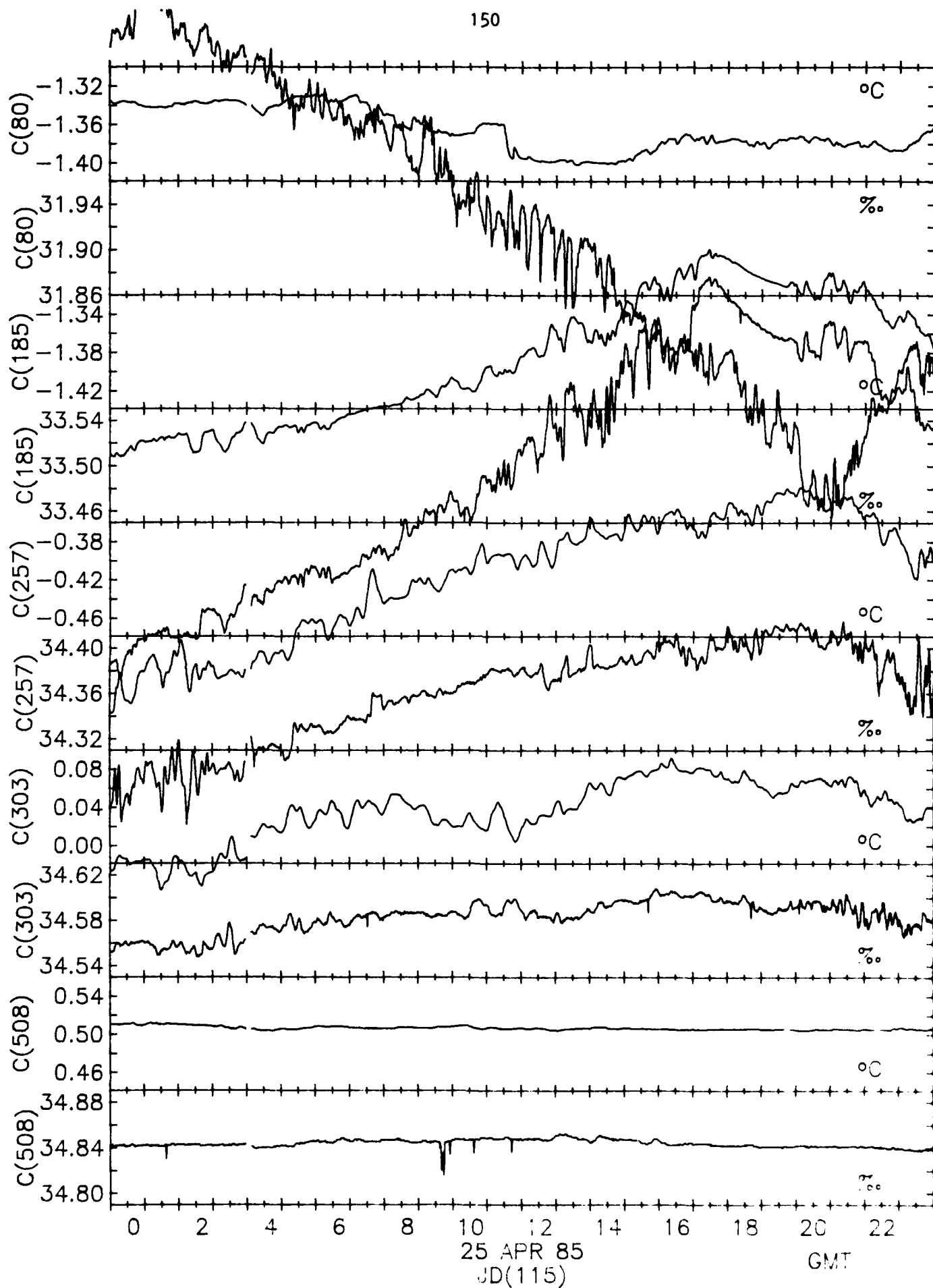




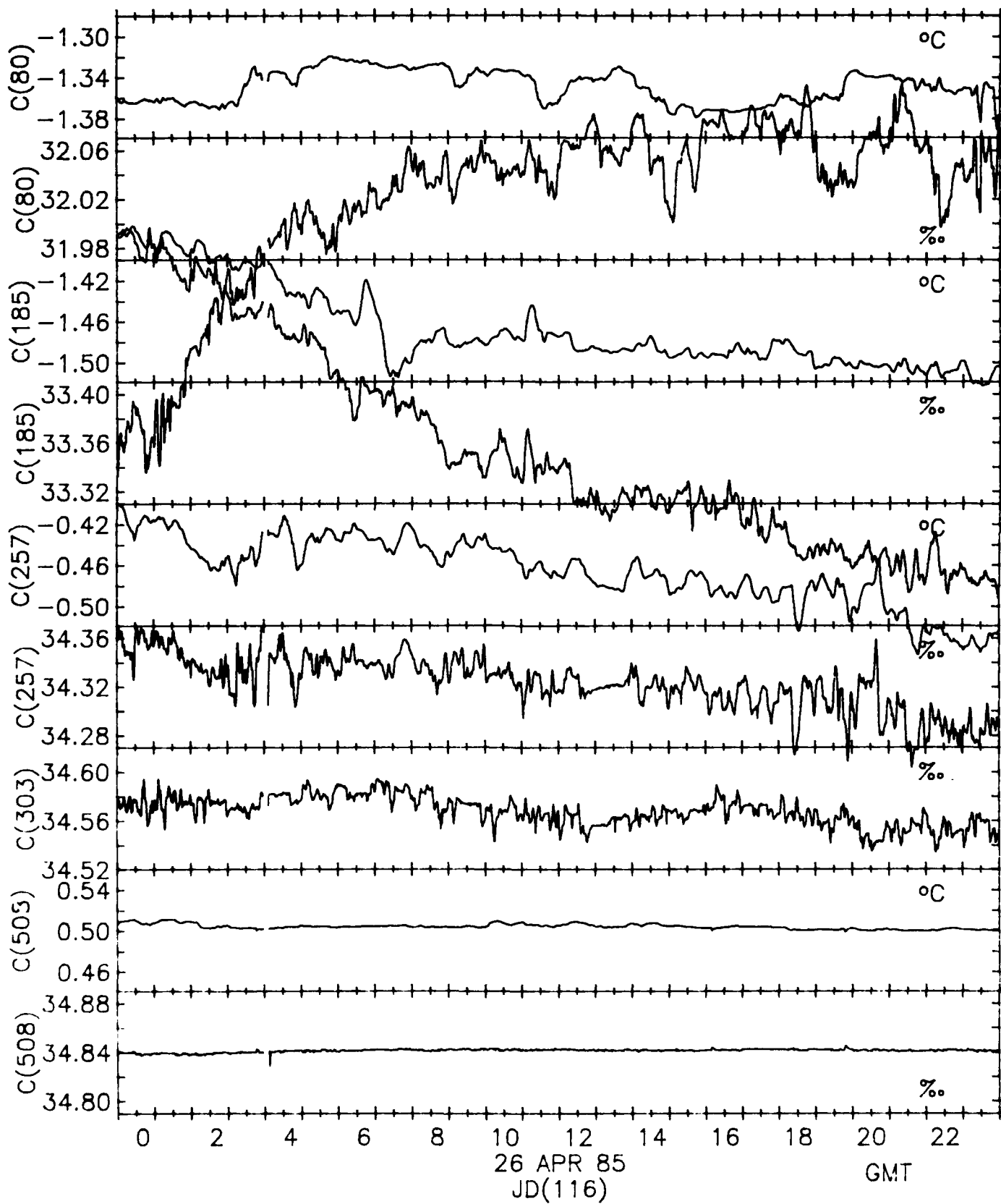


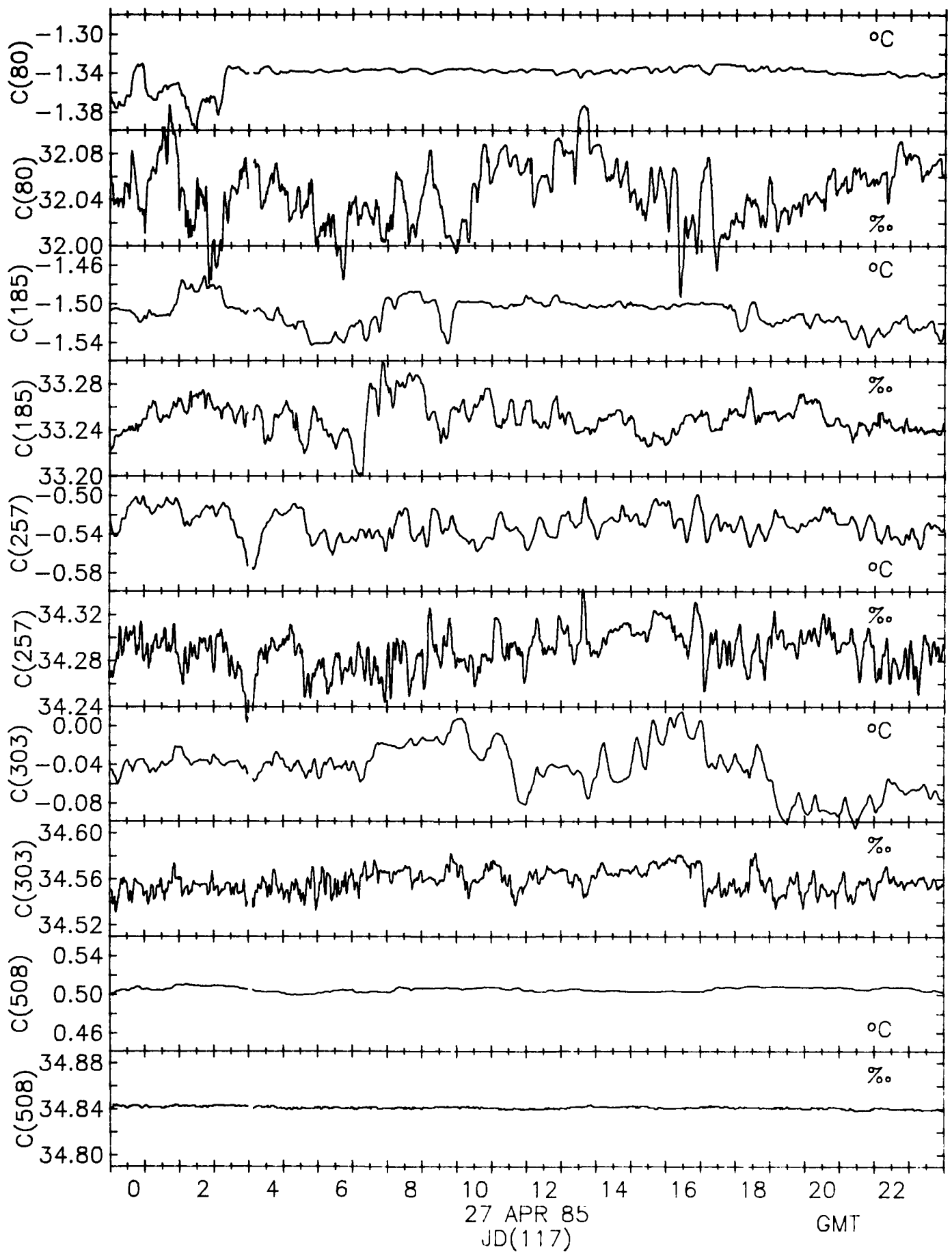


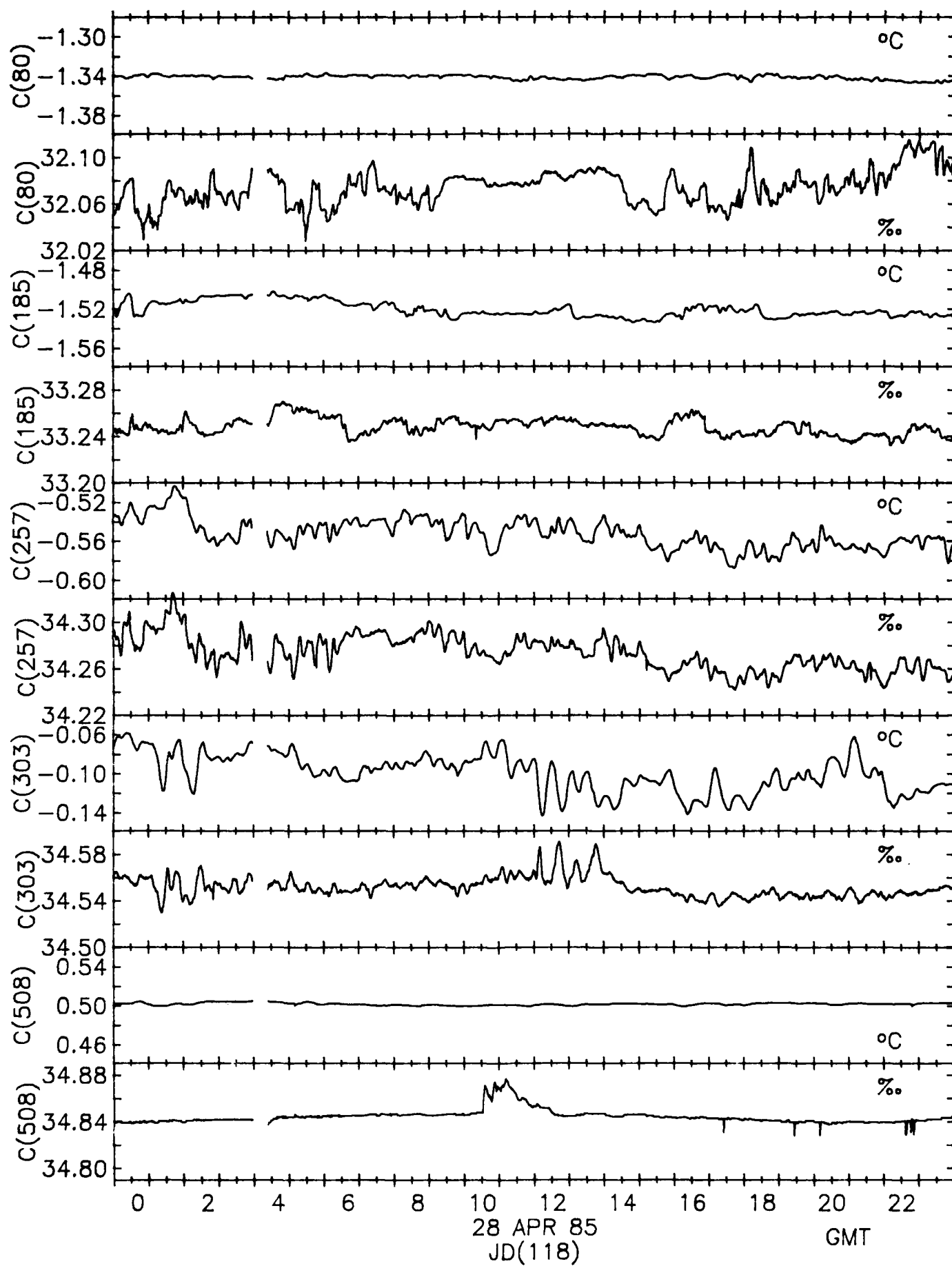


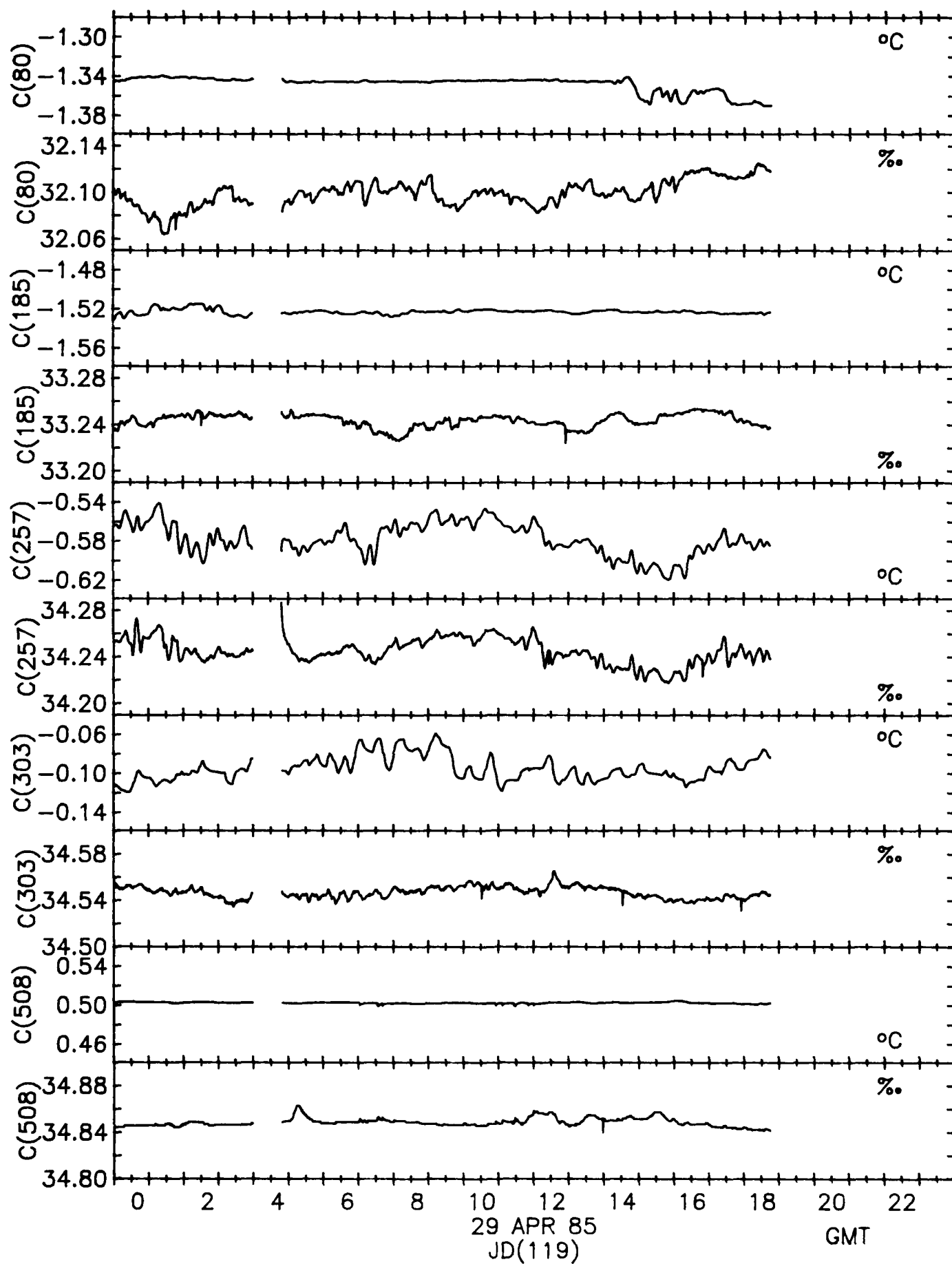






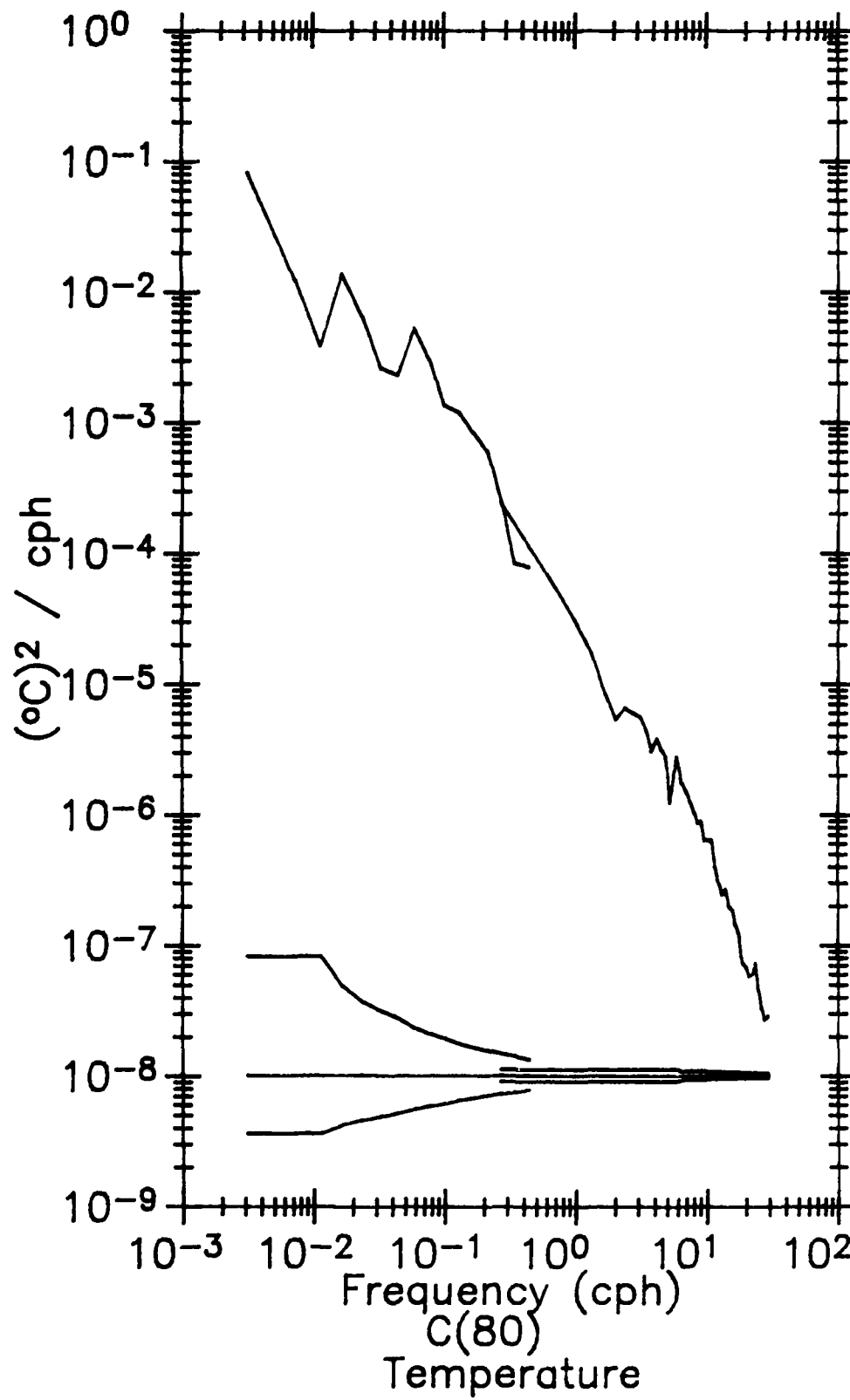


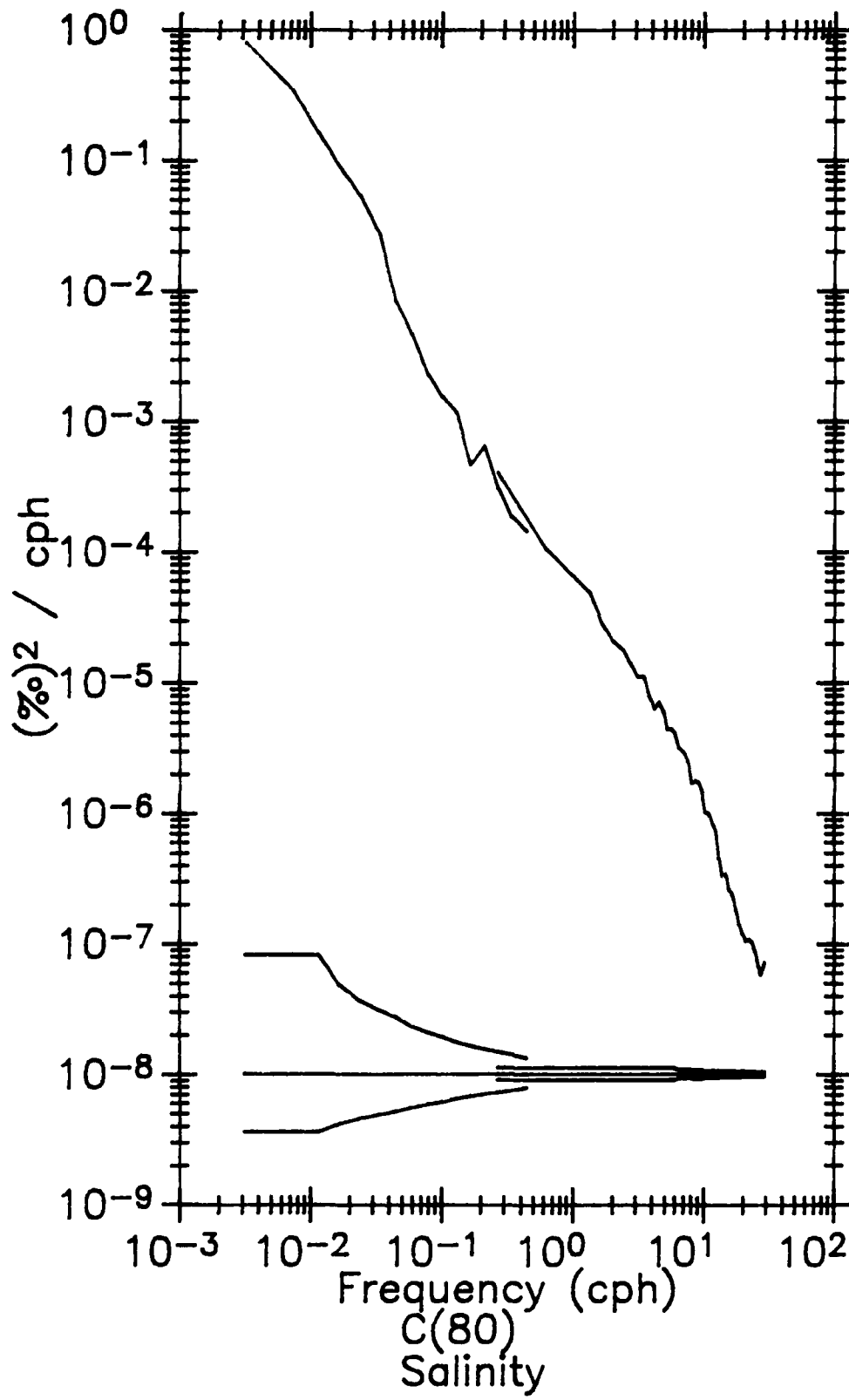


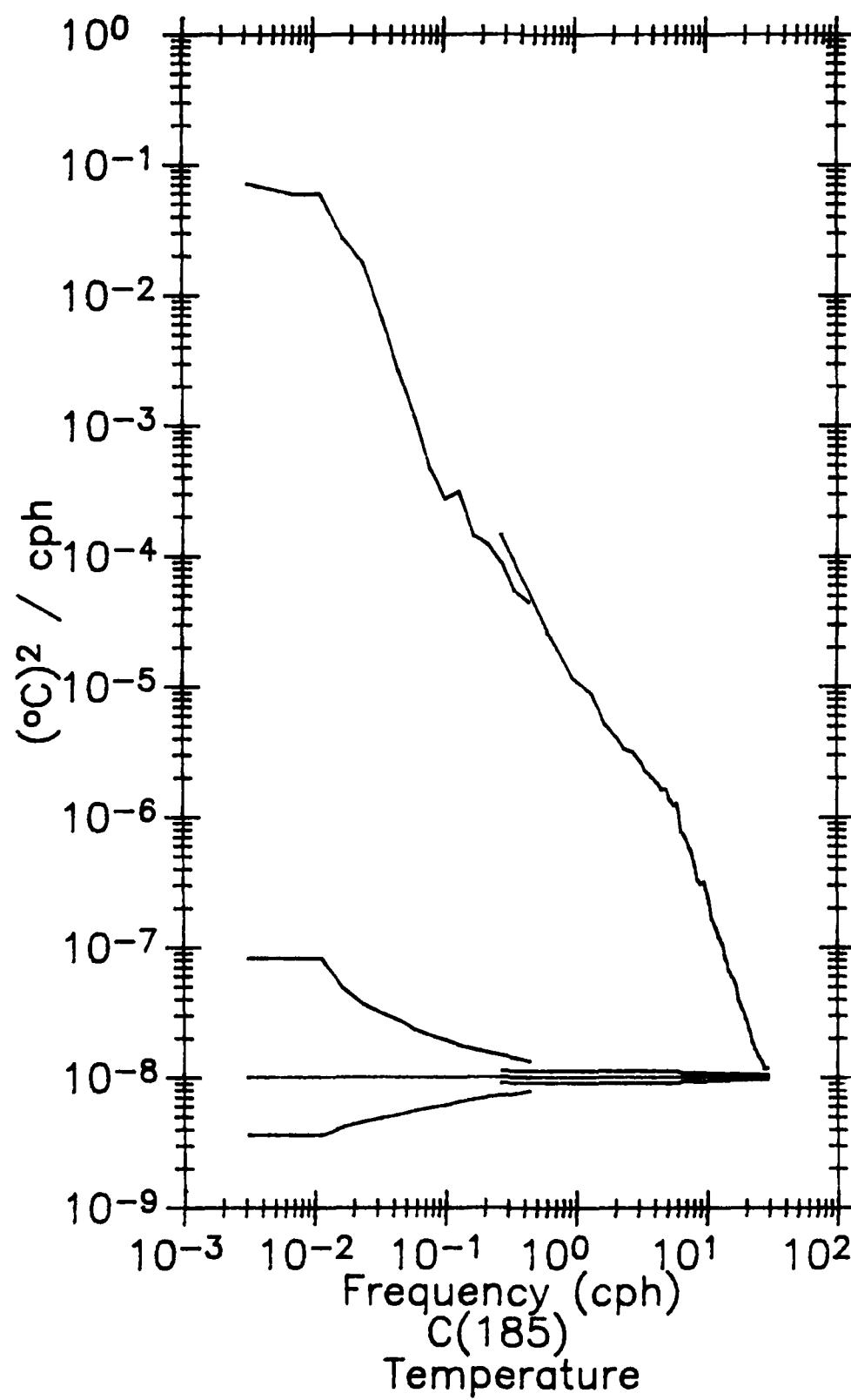


## SPECTRA OF TEMPERATURE AND SALINITY

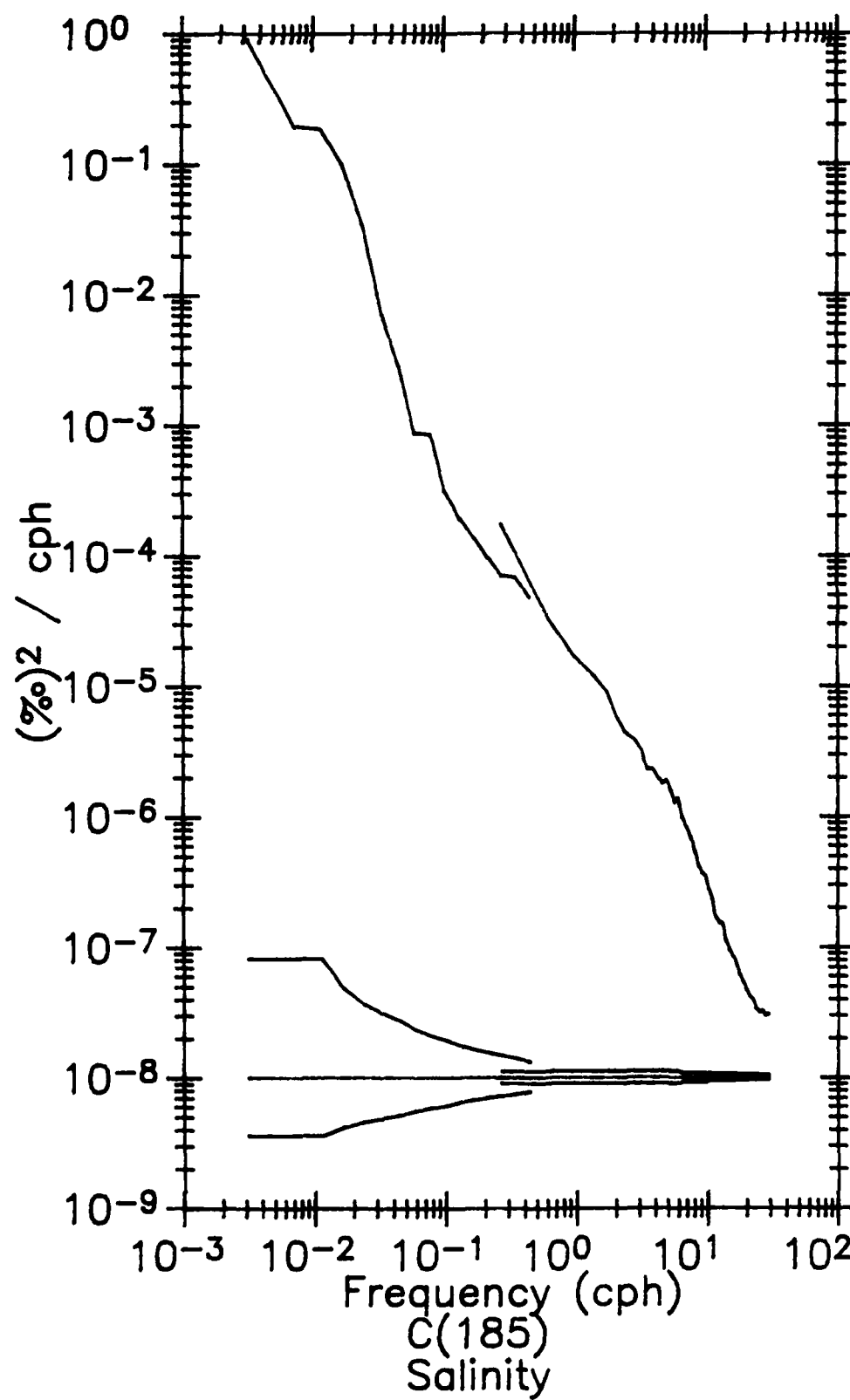
Spectra of temperature and salinity from all the sensors on the central mooring are followed by temperature spectra from the satellite moorings.

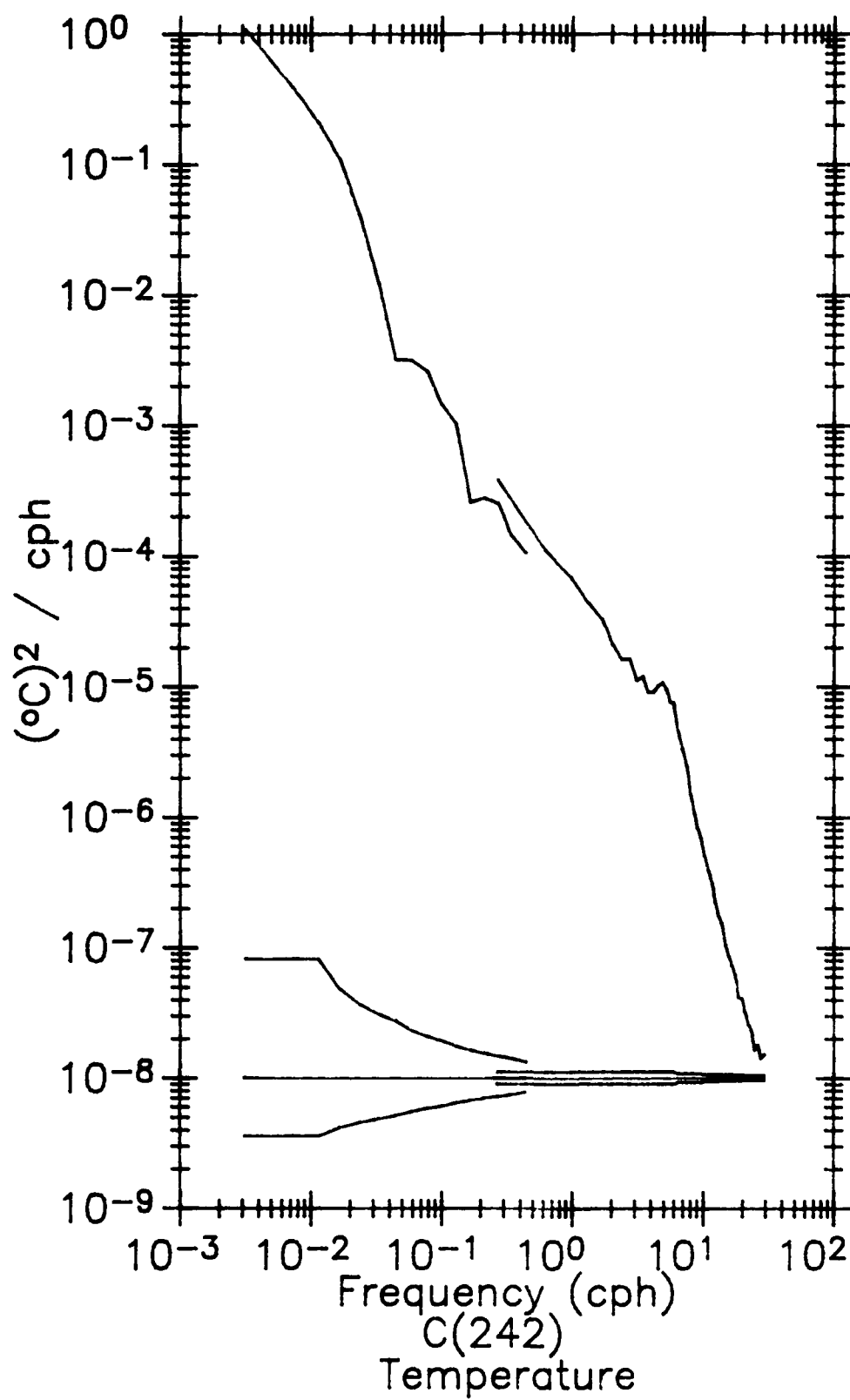


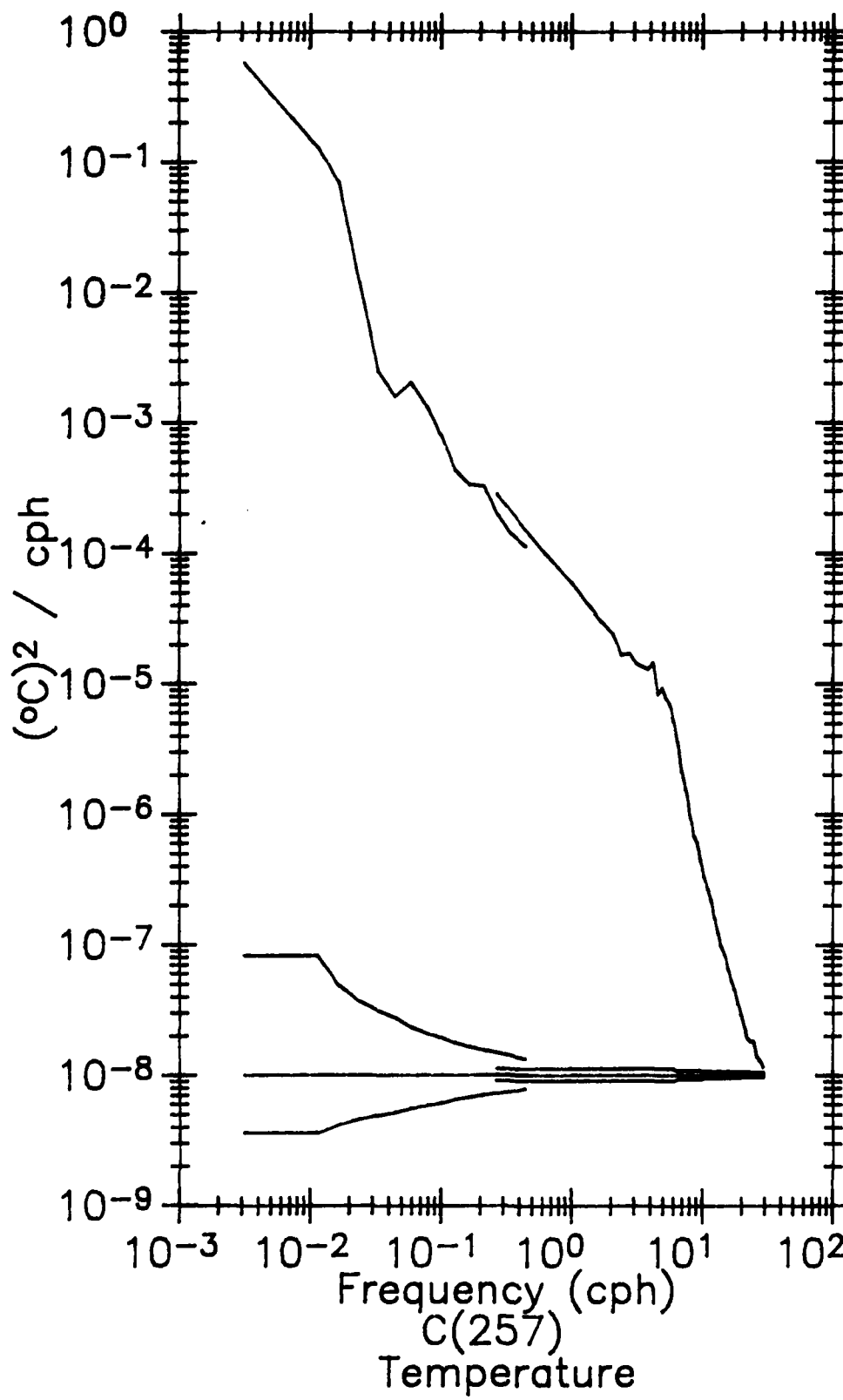


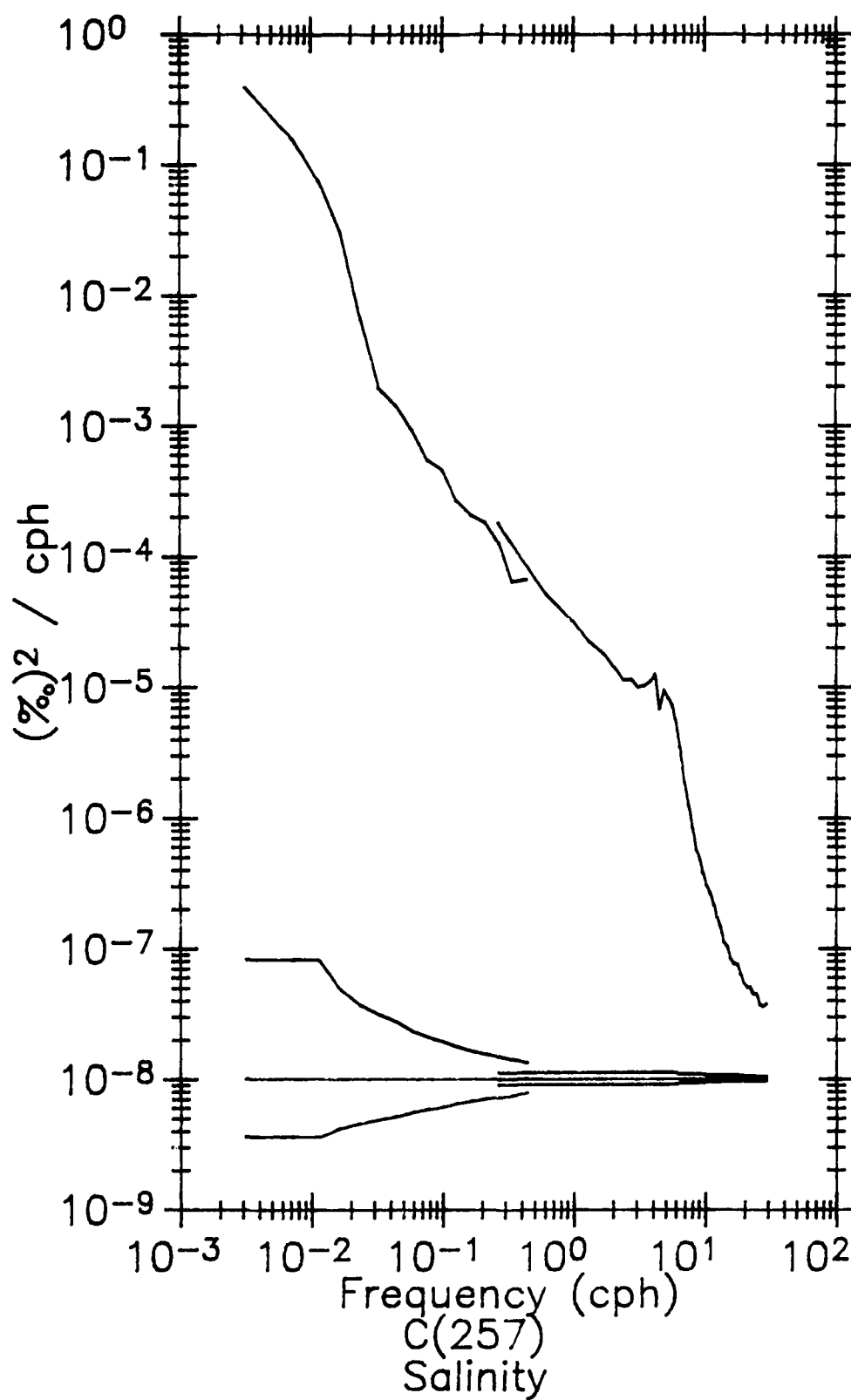


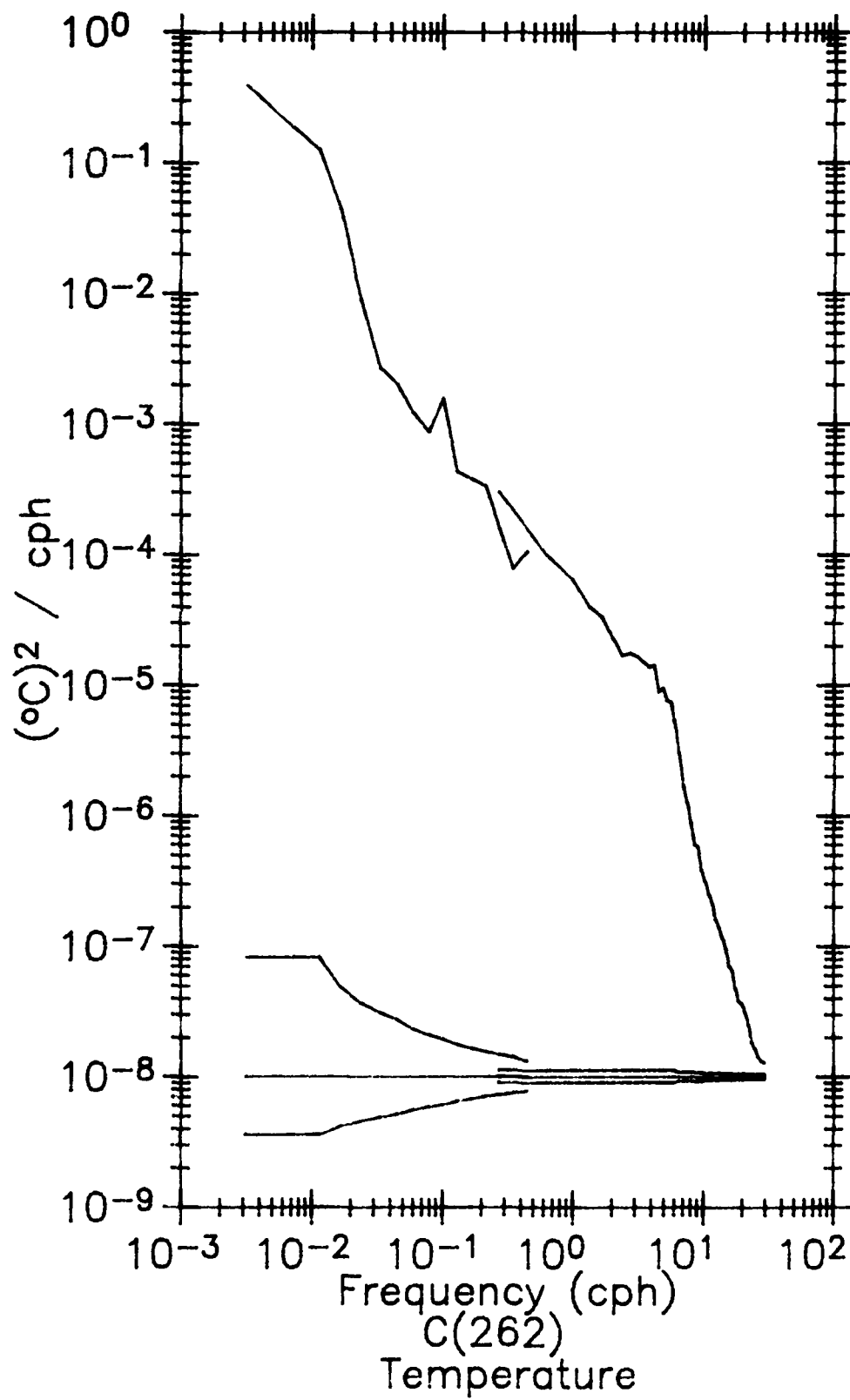


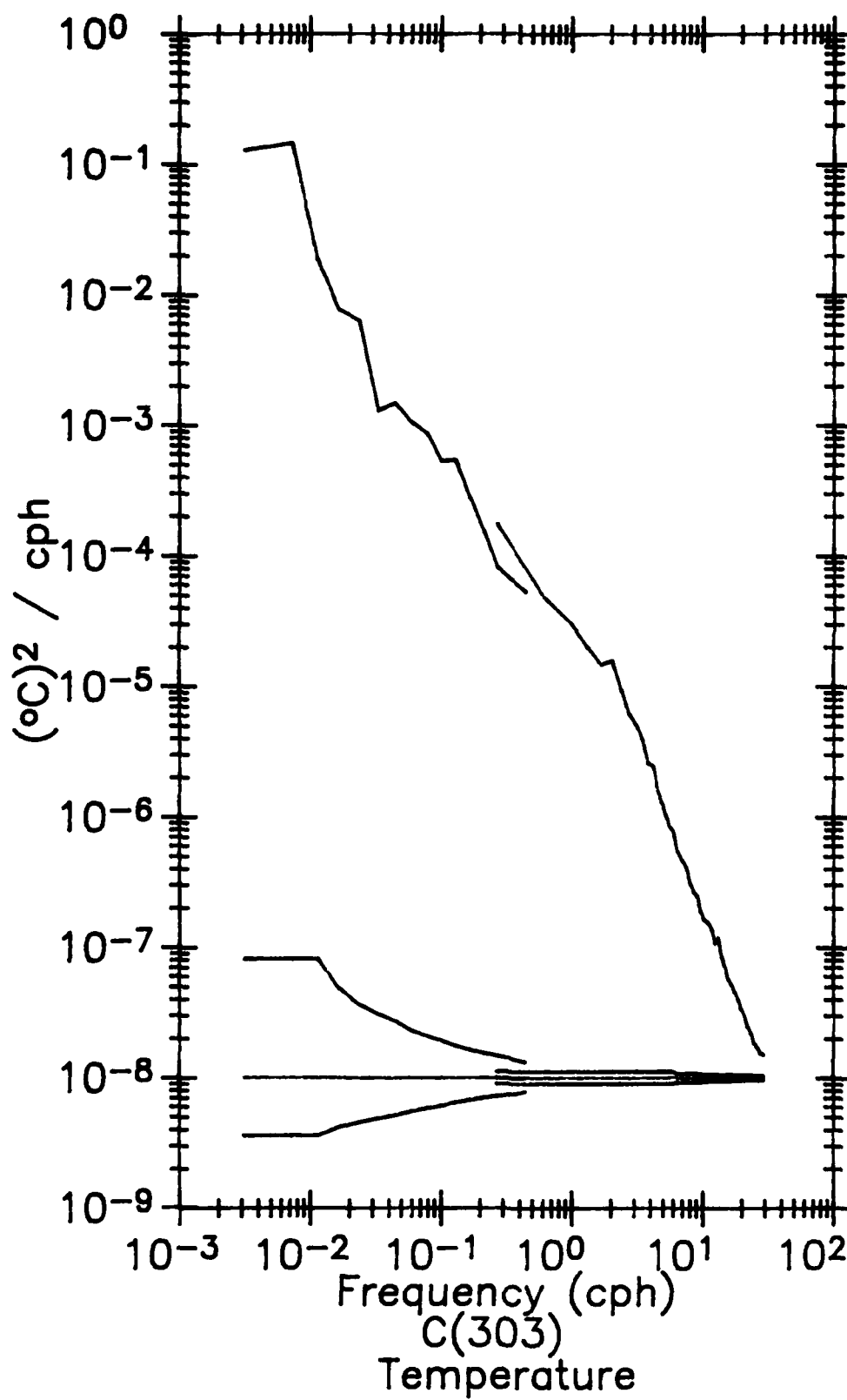


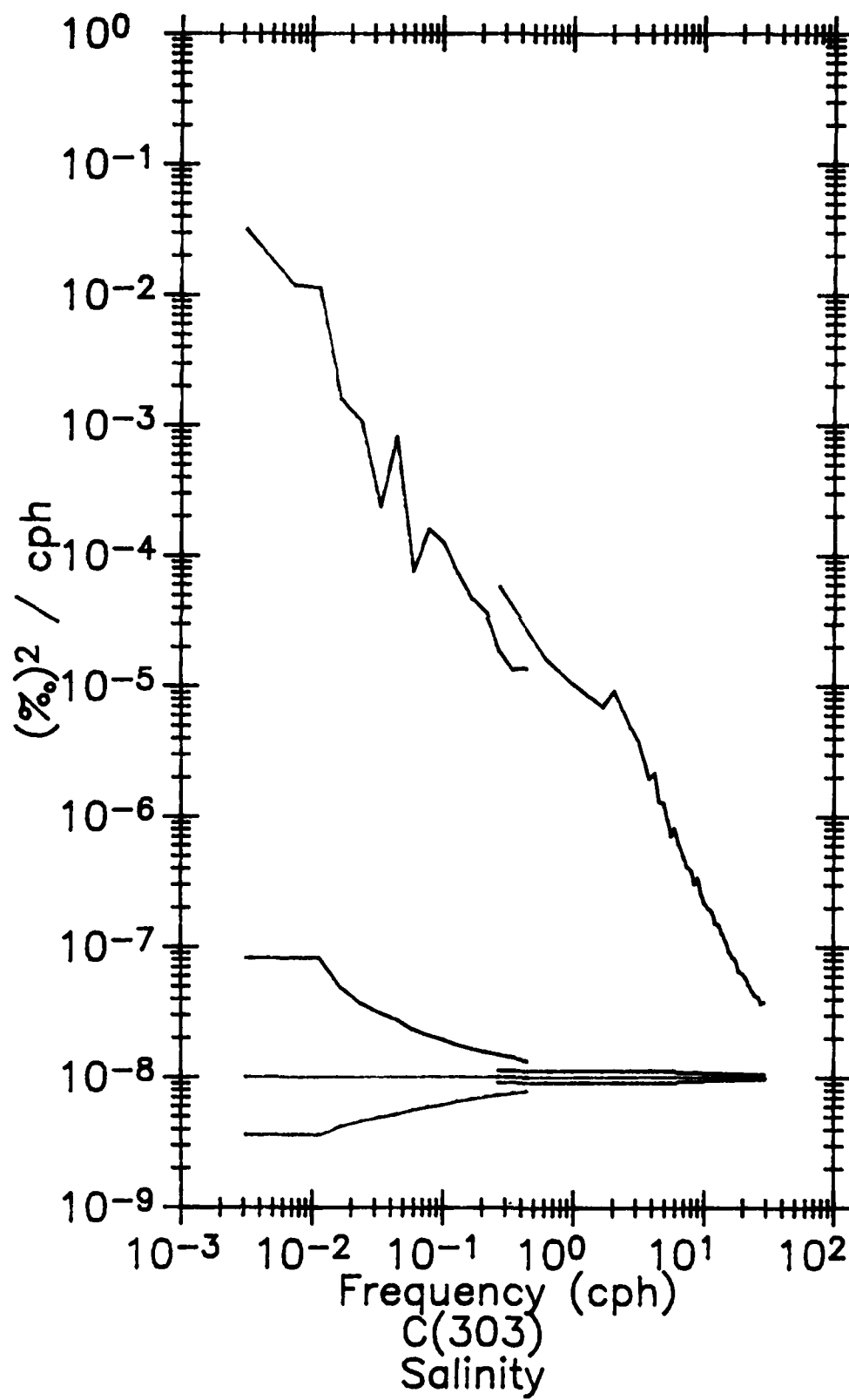


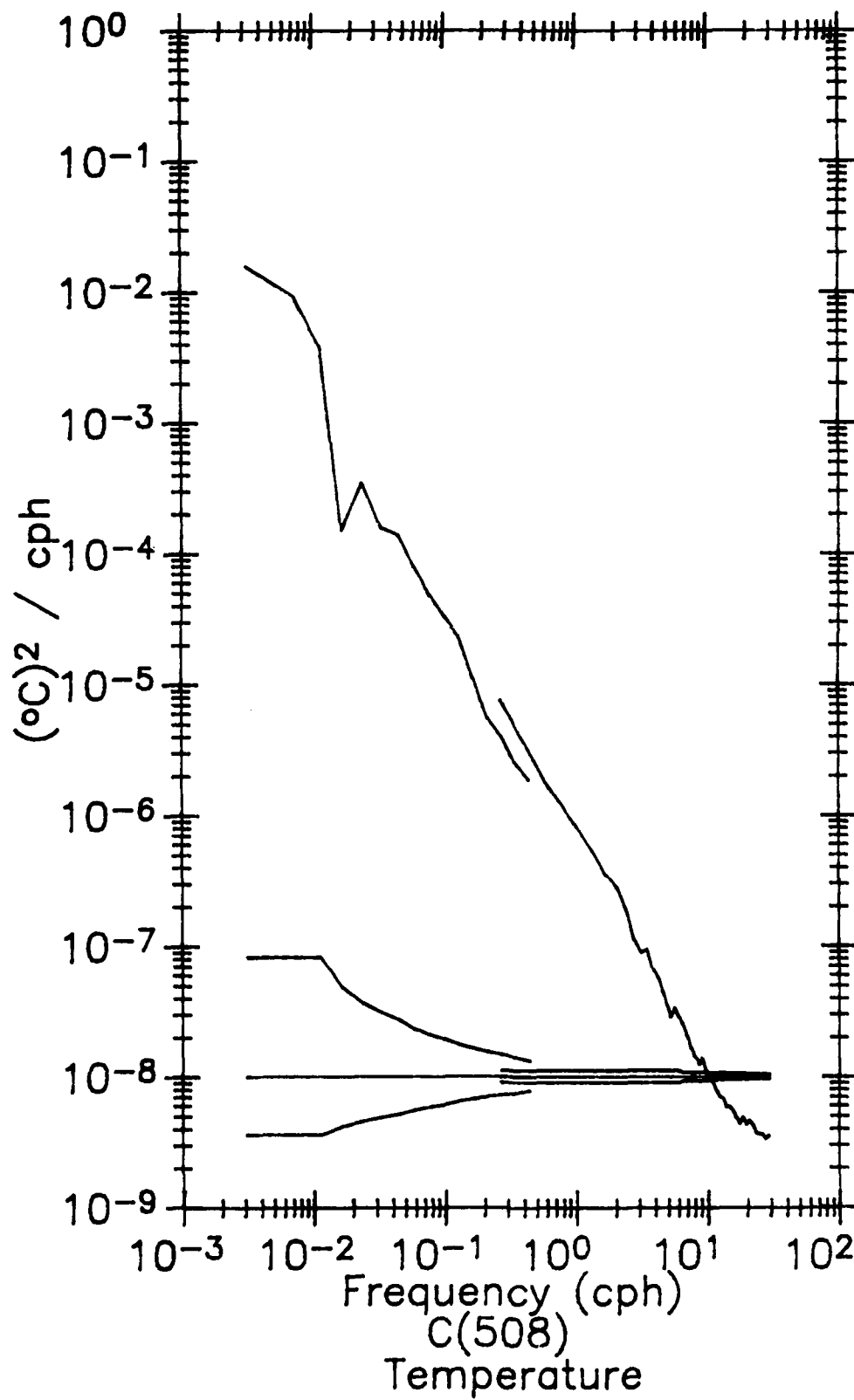




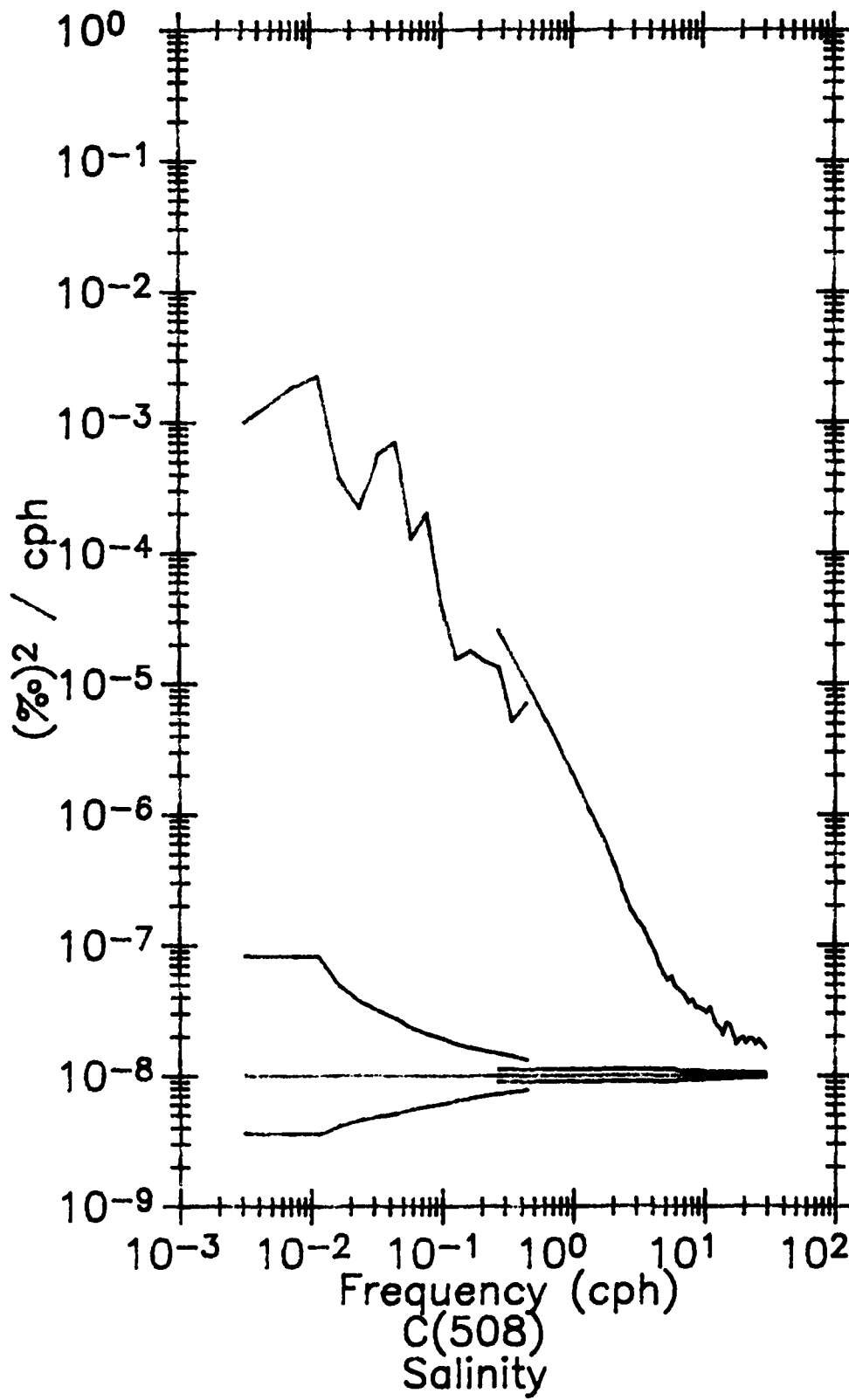


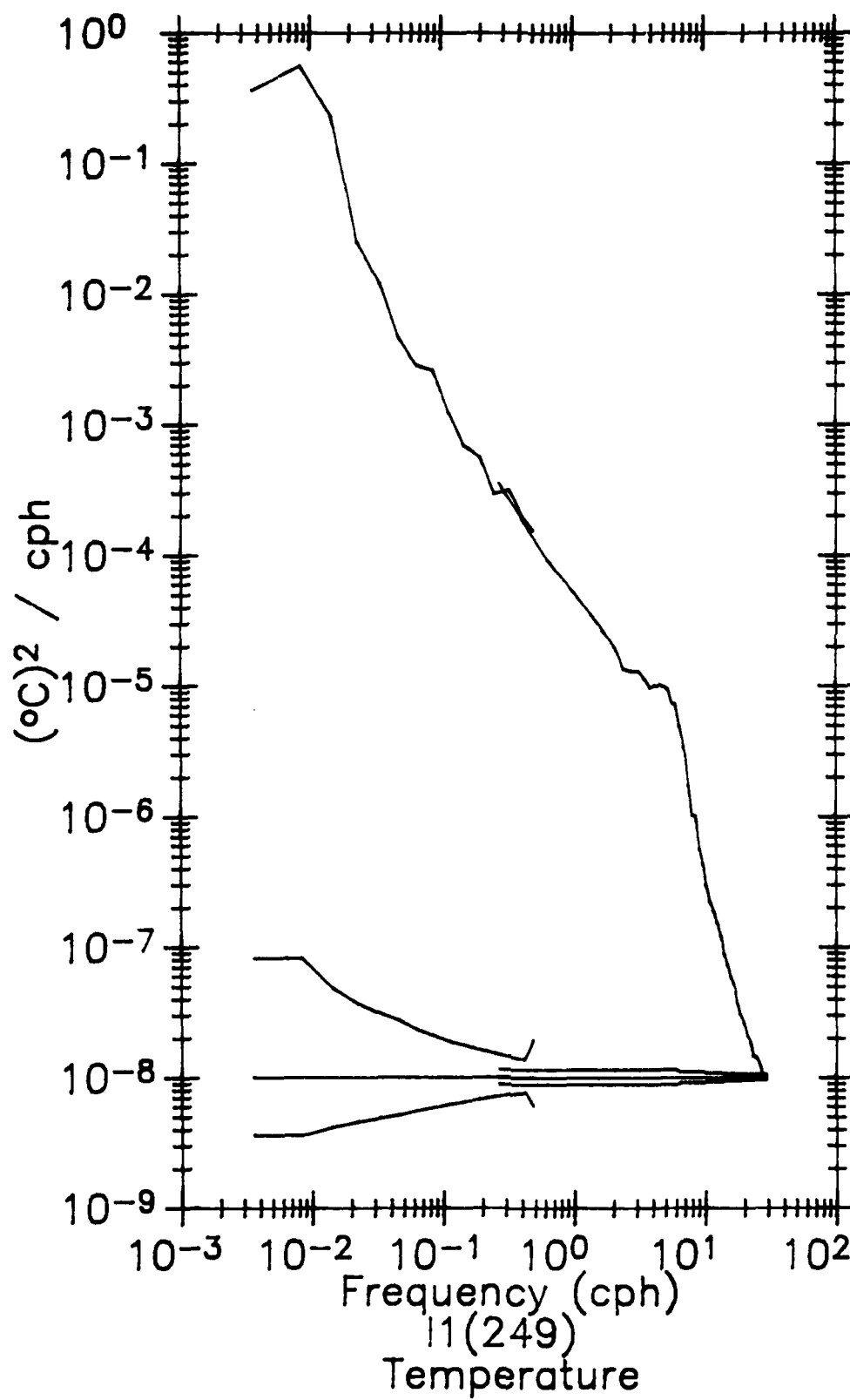


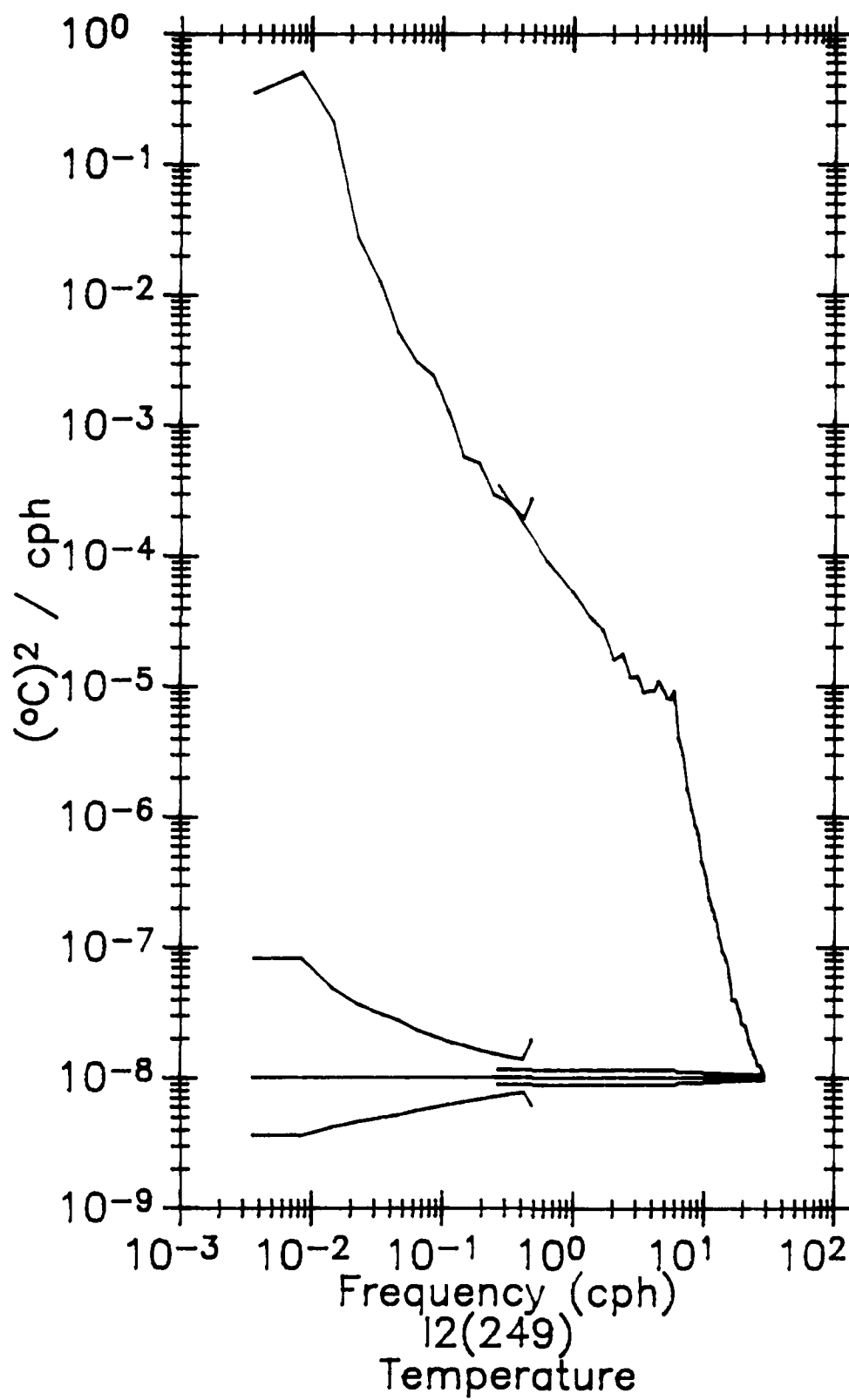


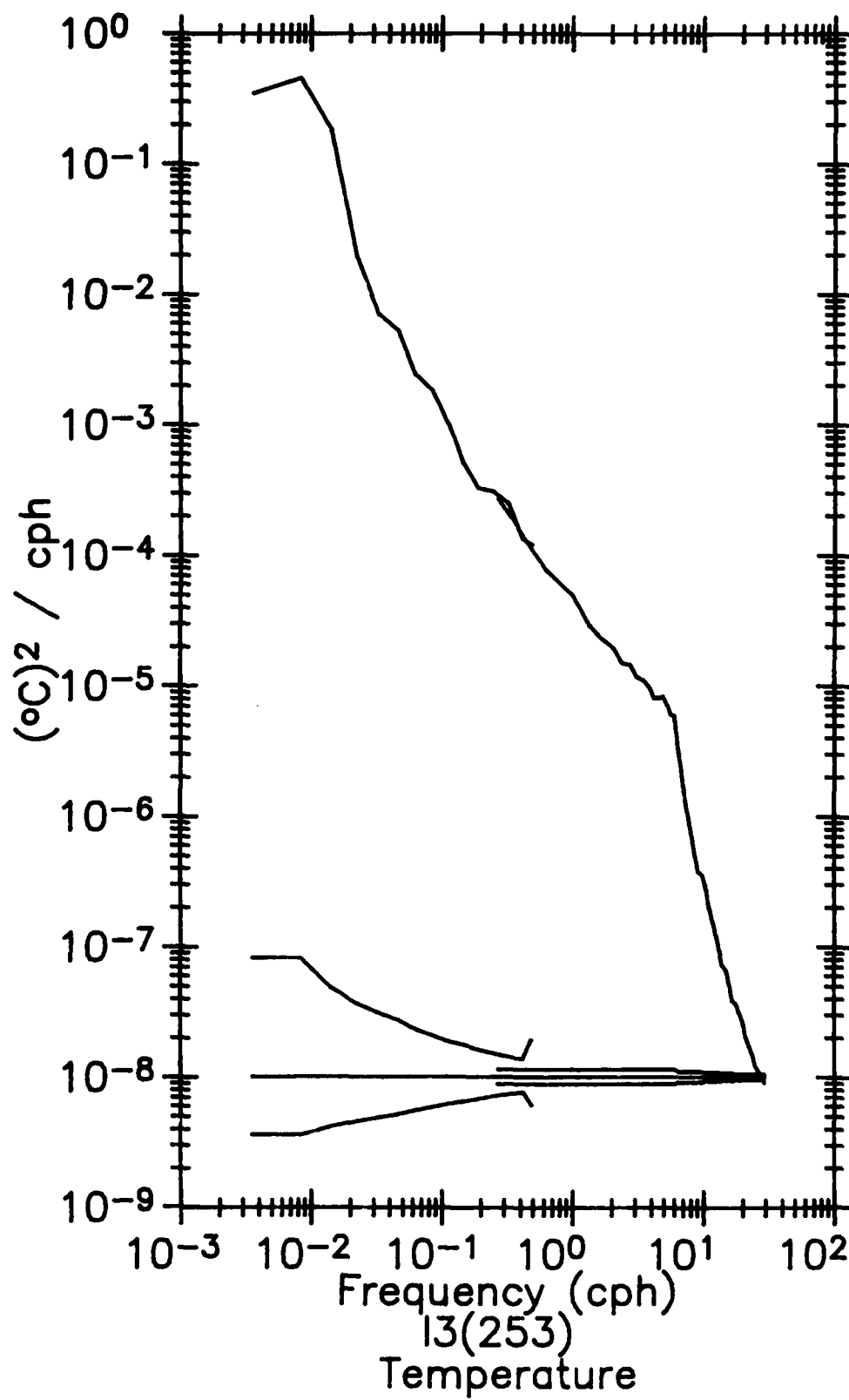


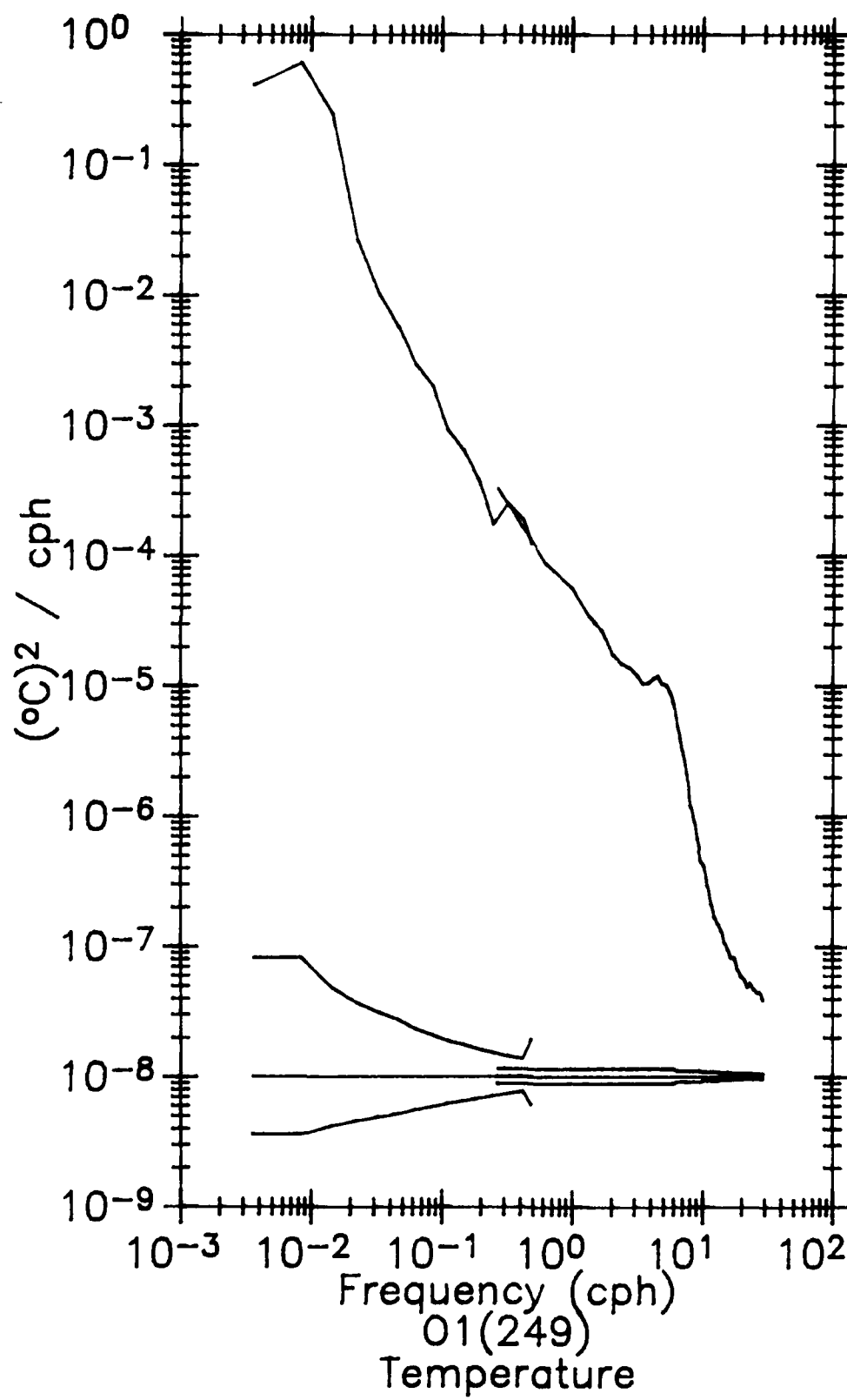


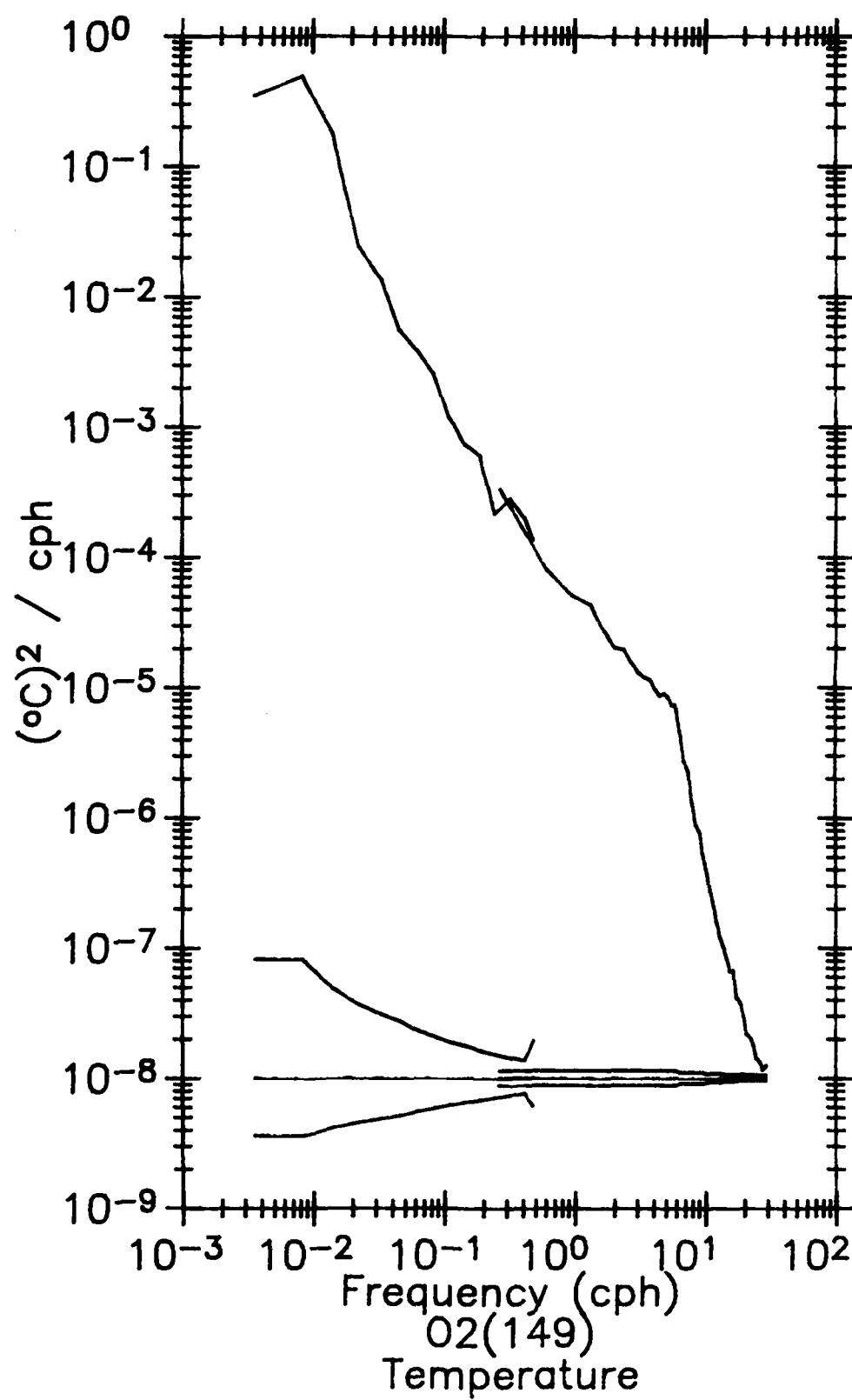


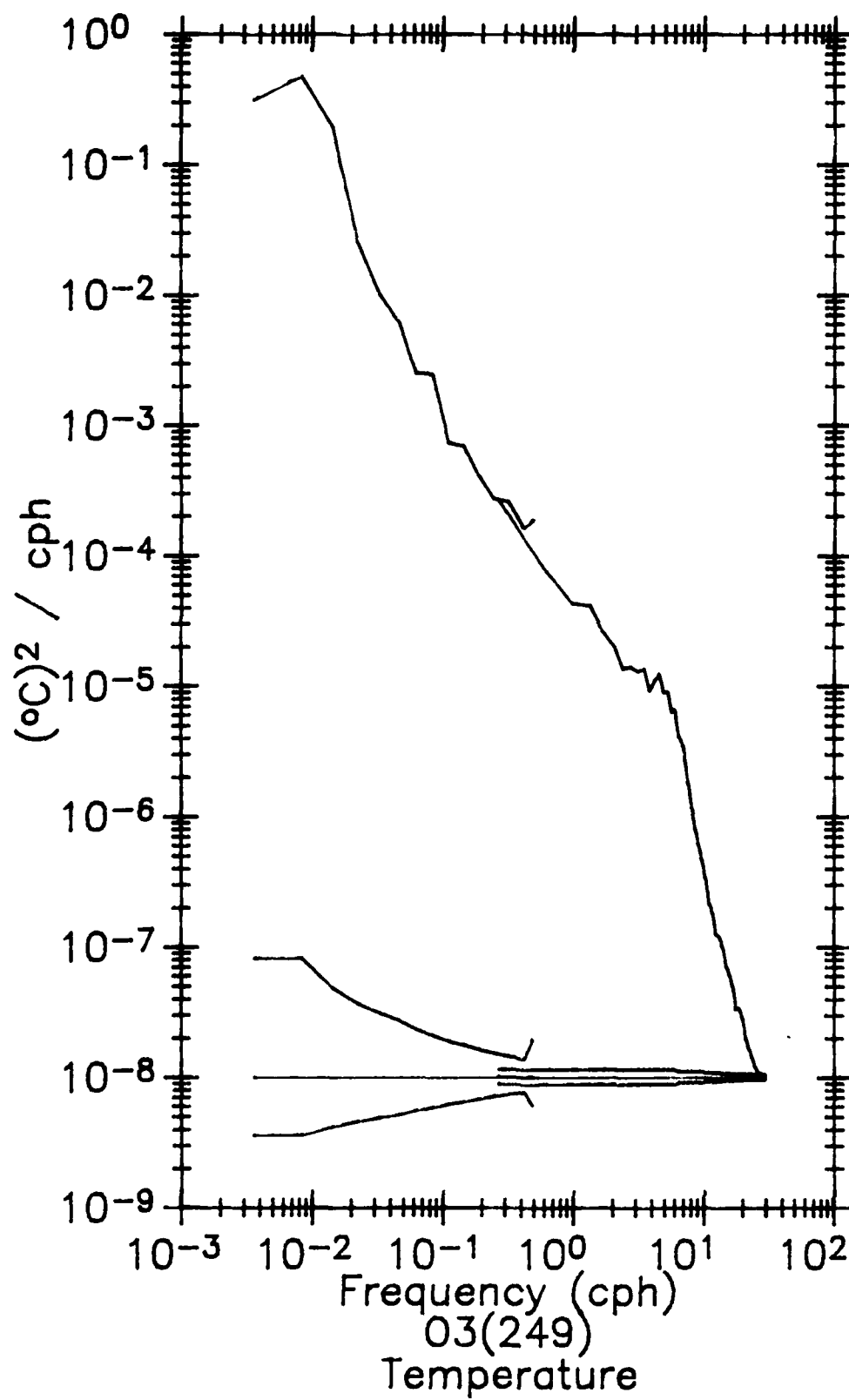












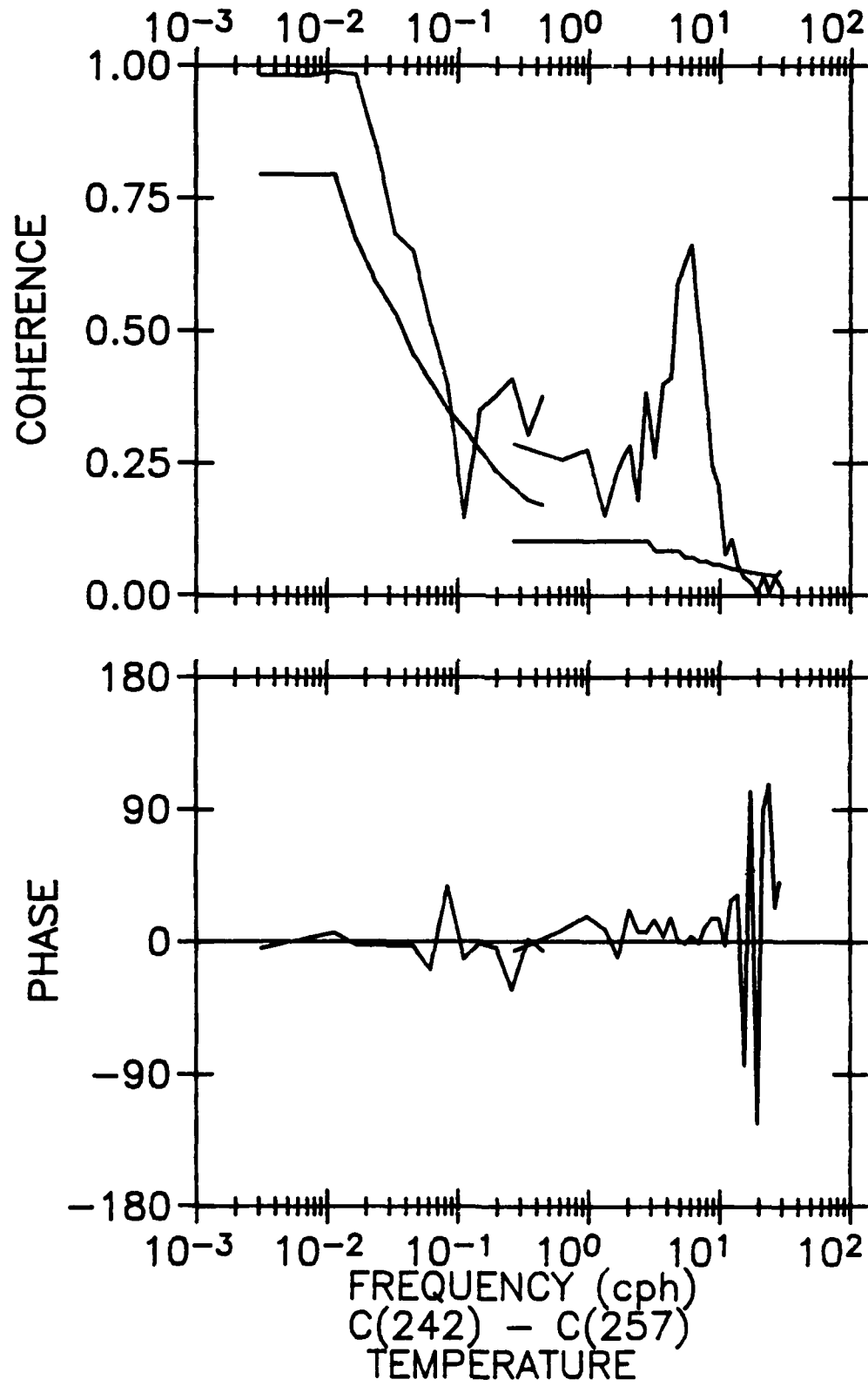
PREVIOUS PAGE  
IS BLANK

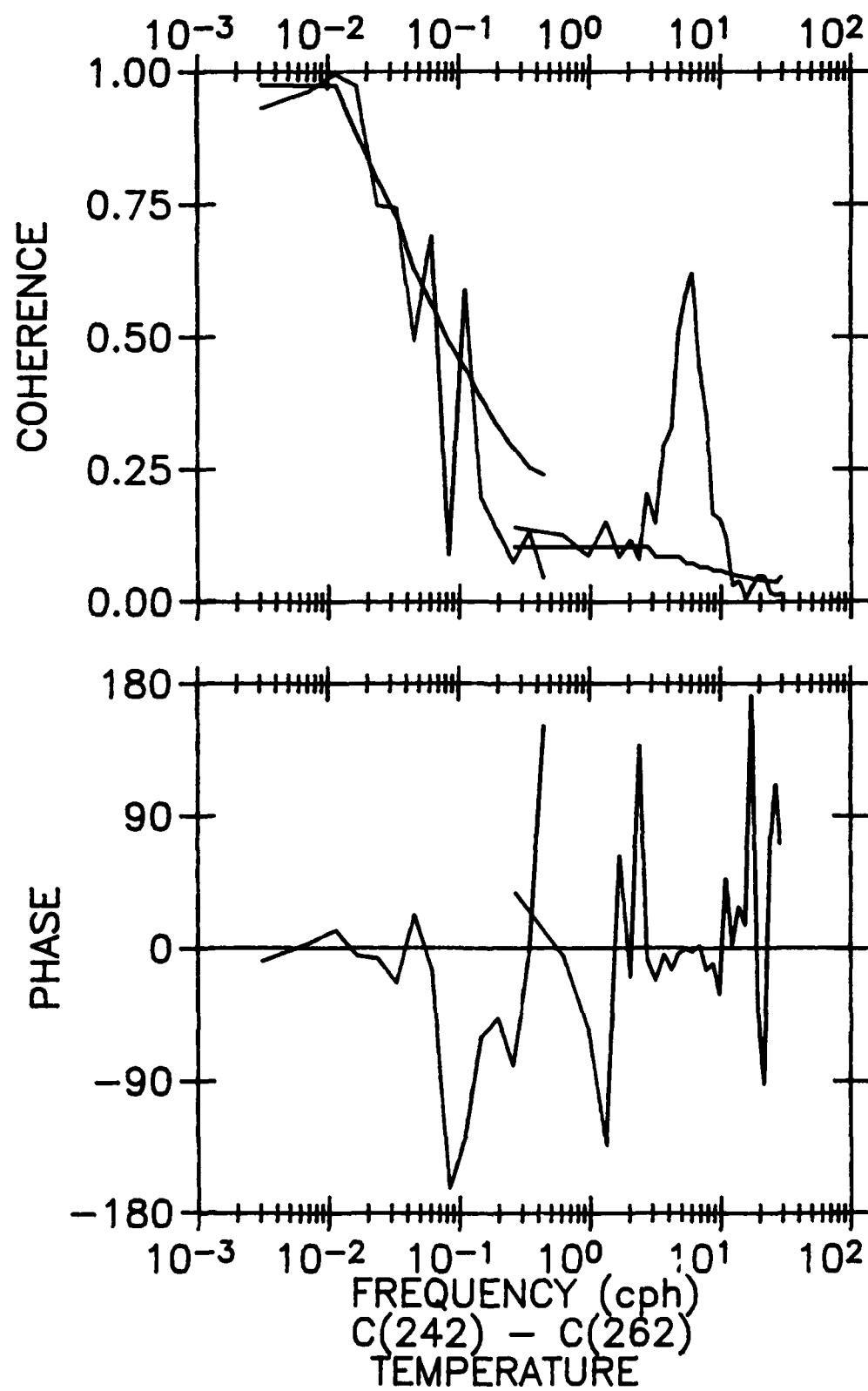


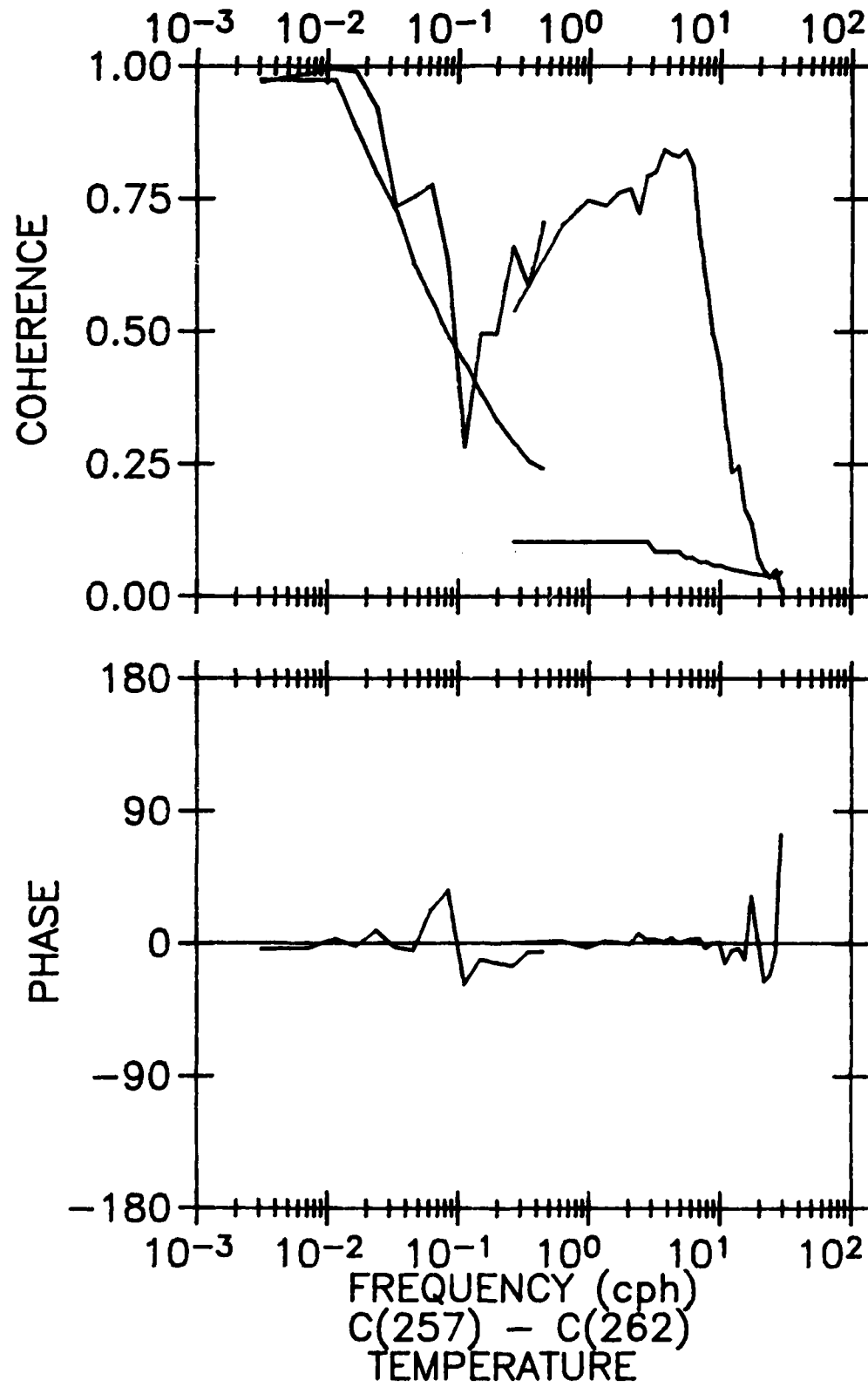
## VERTICAL COHERENCES

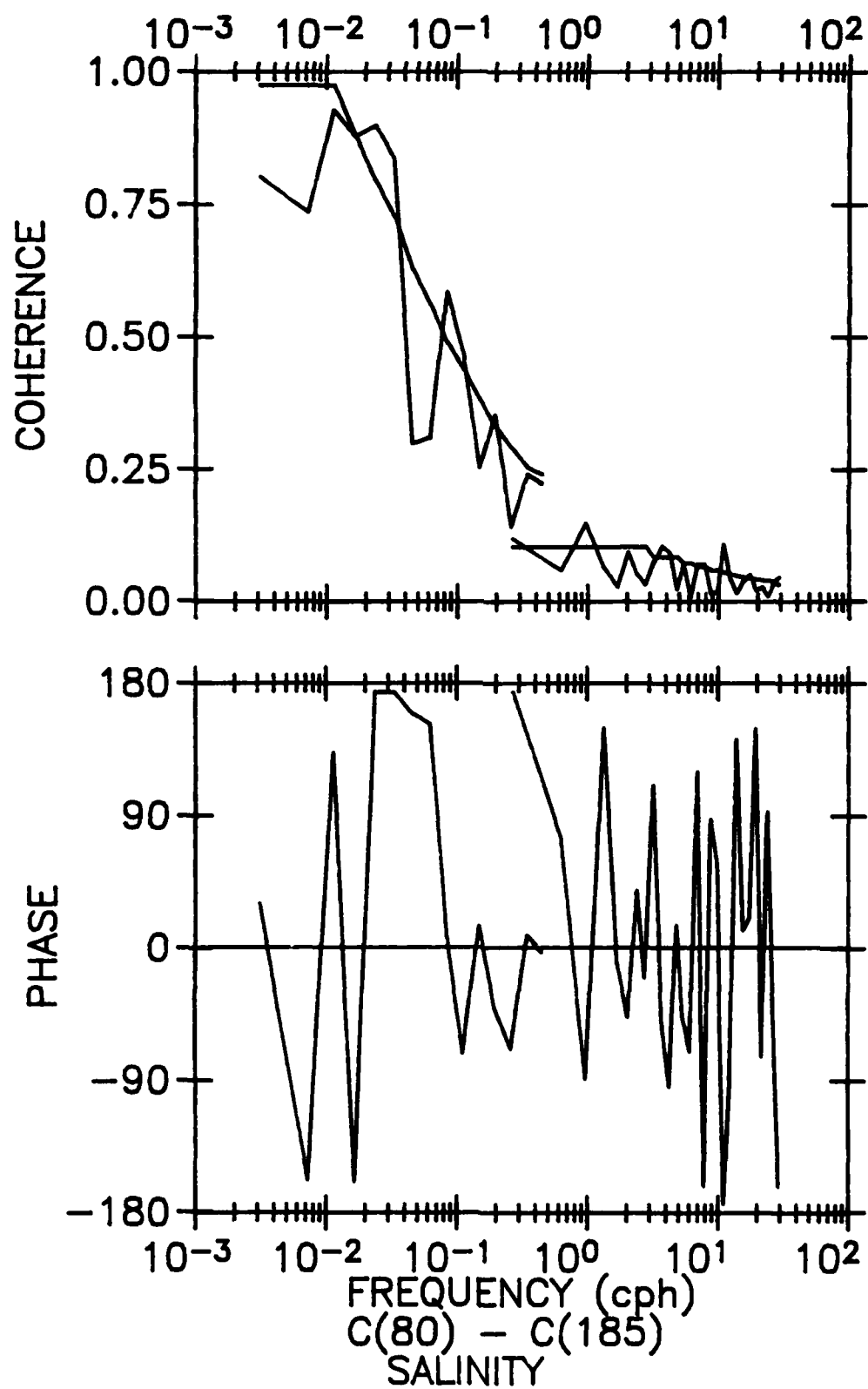
Selected coherences between vertically separated observations on the central mooring.

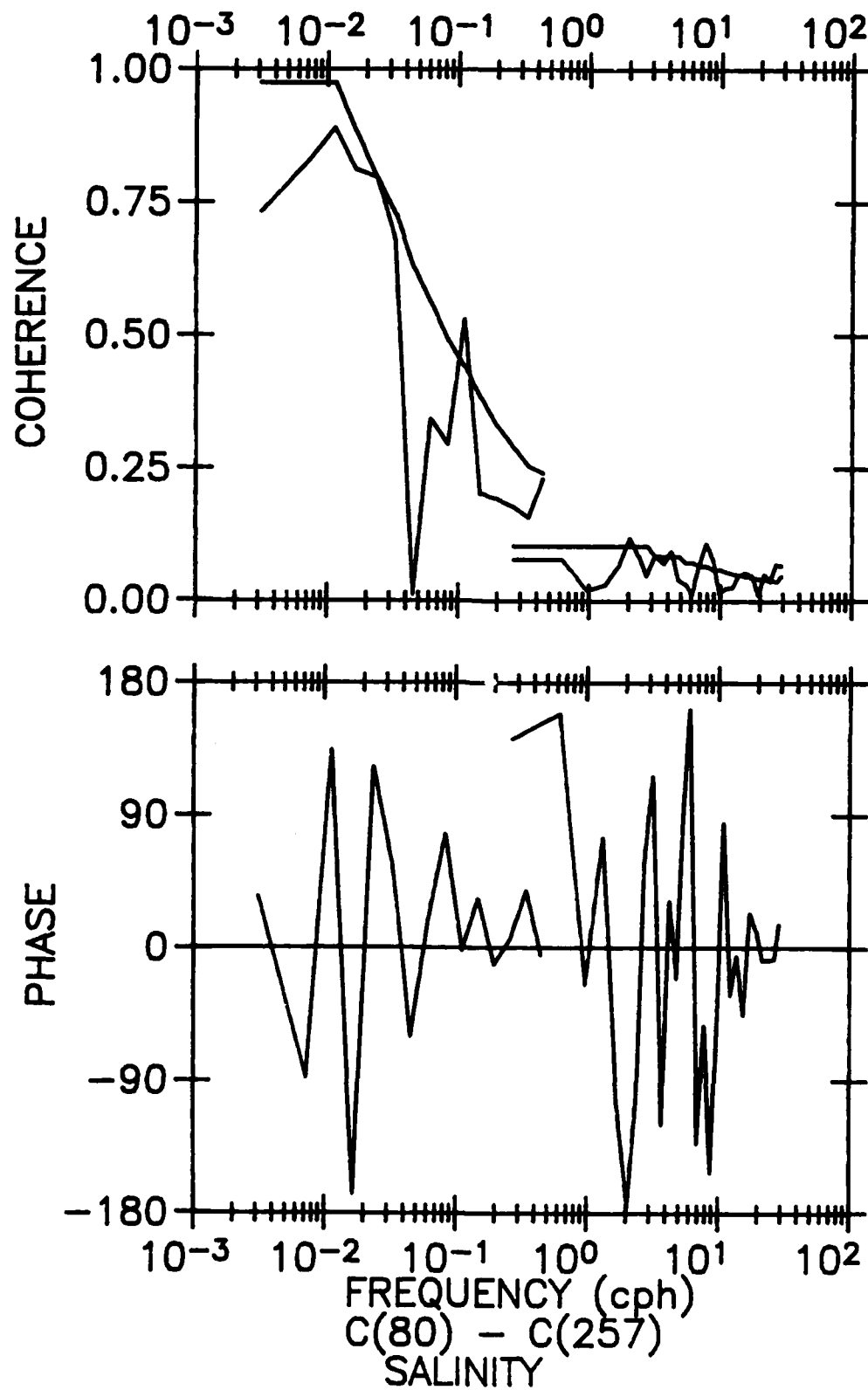


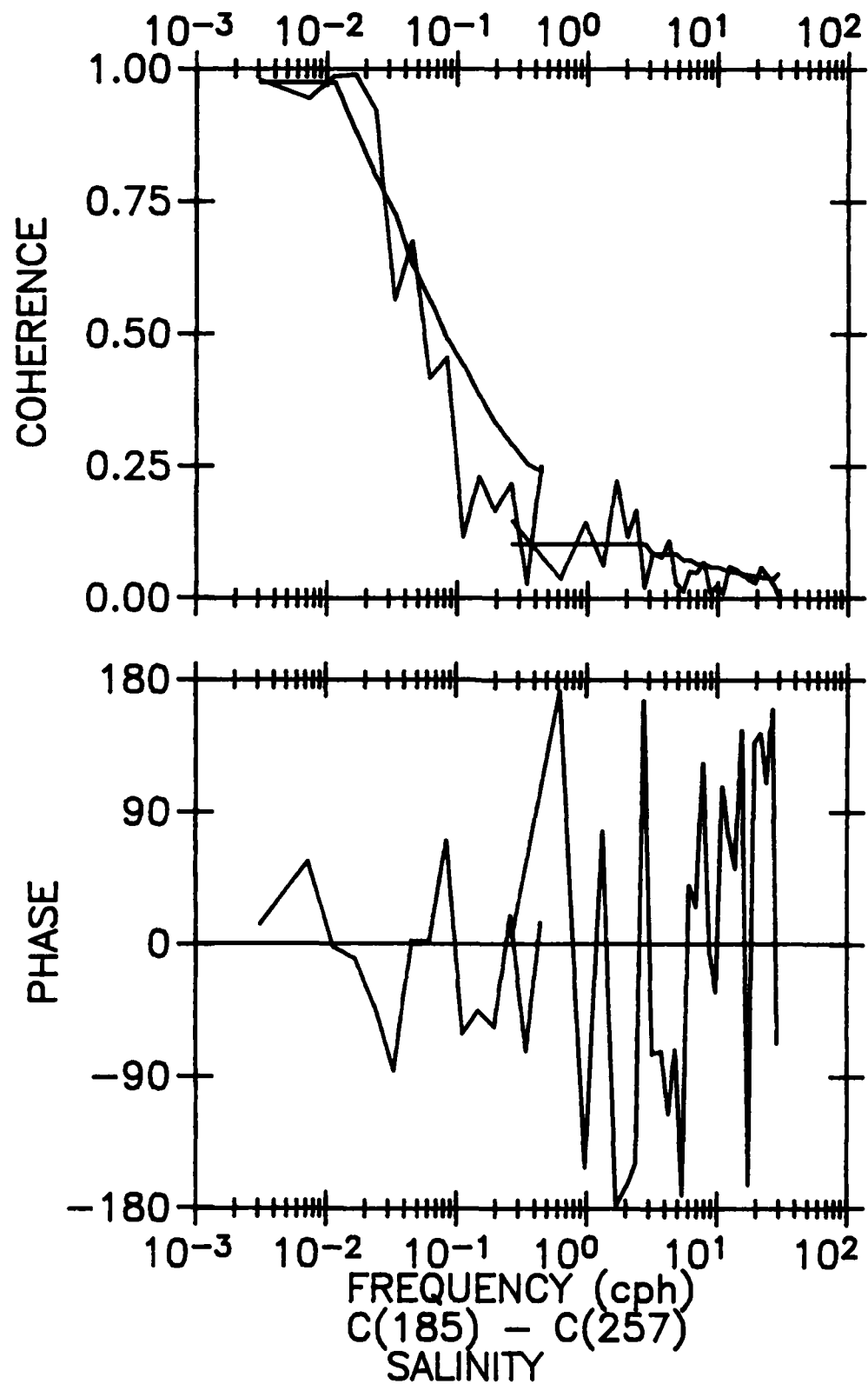


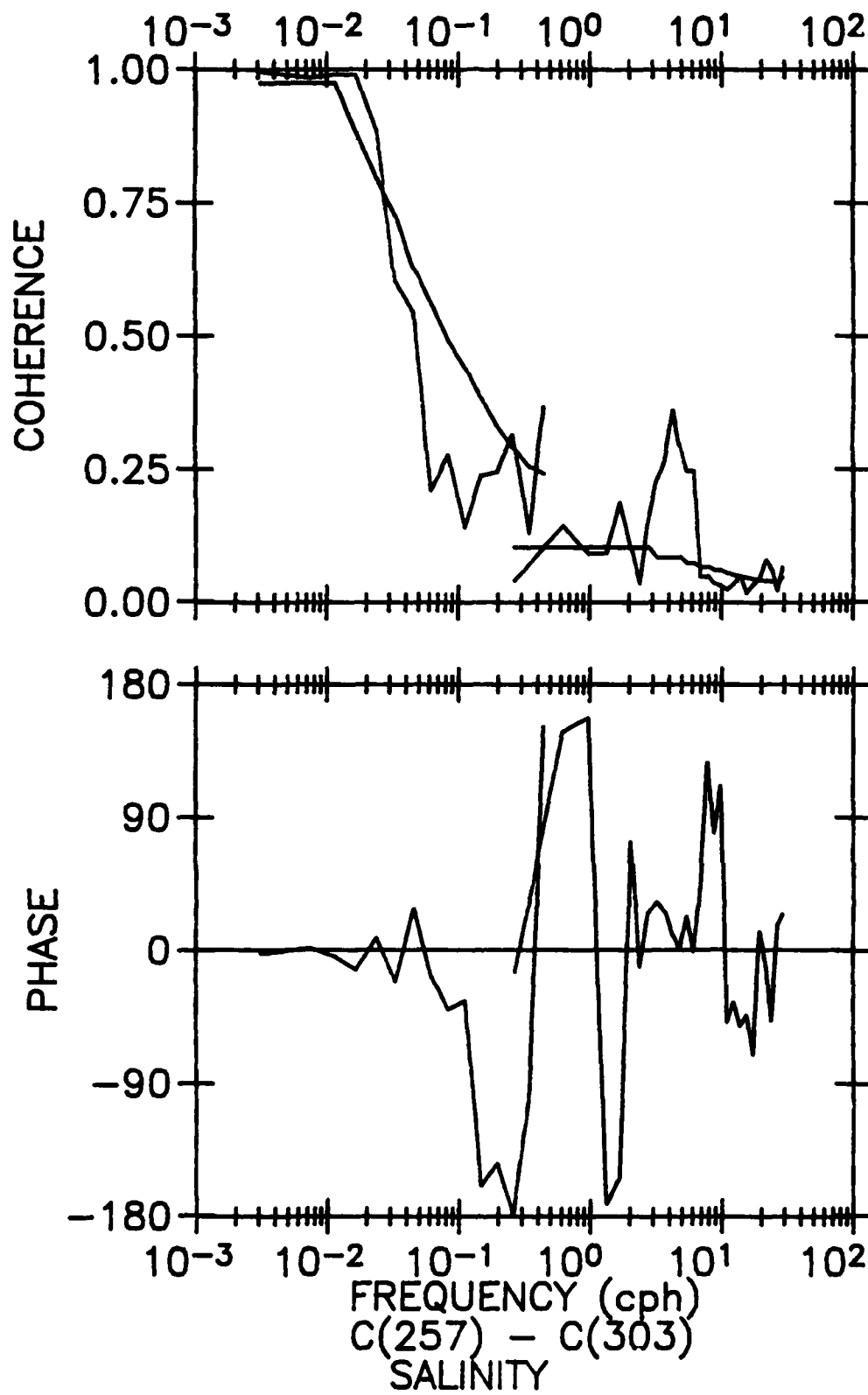


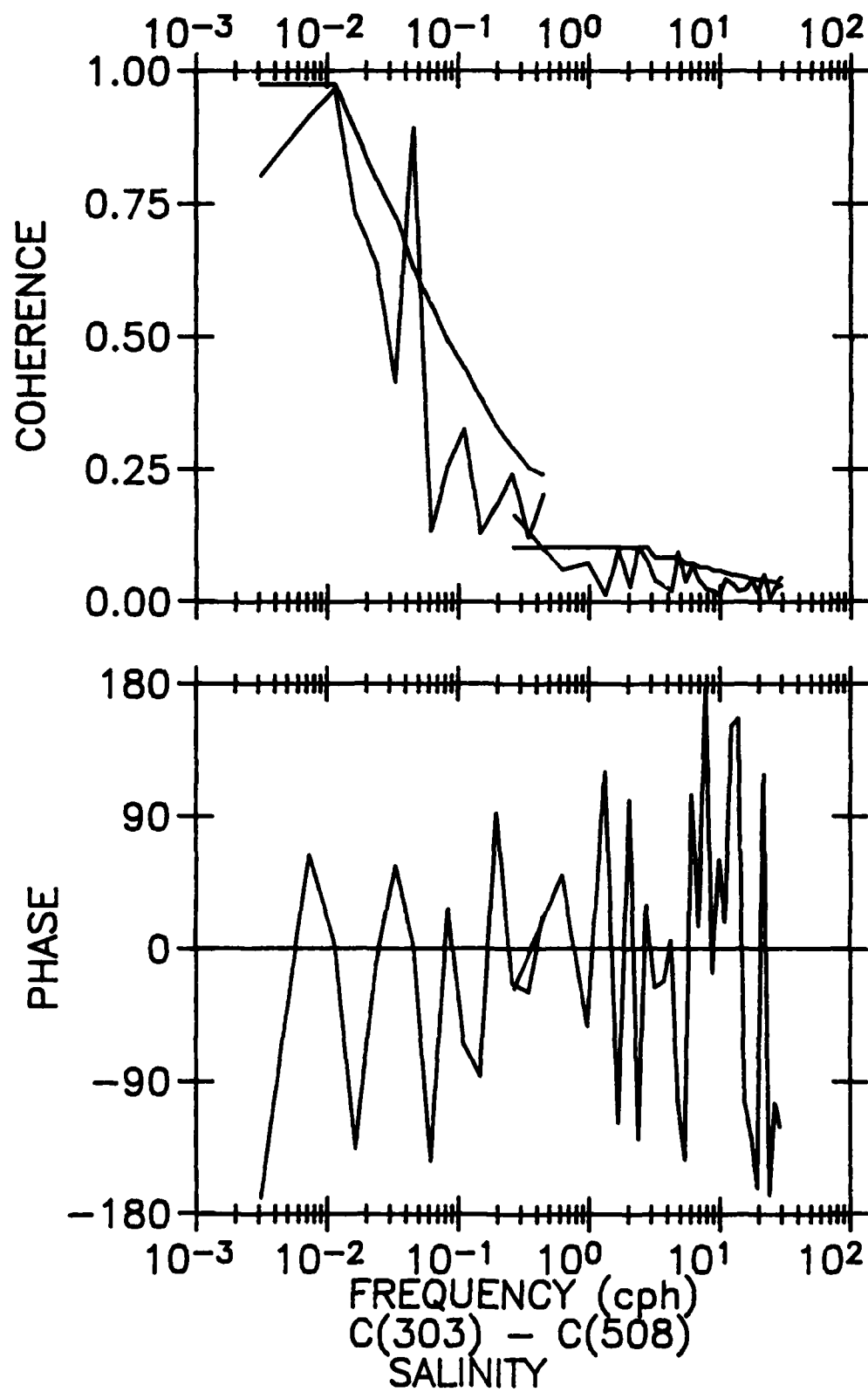










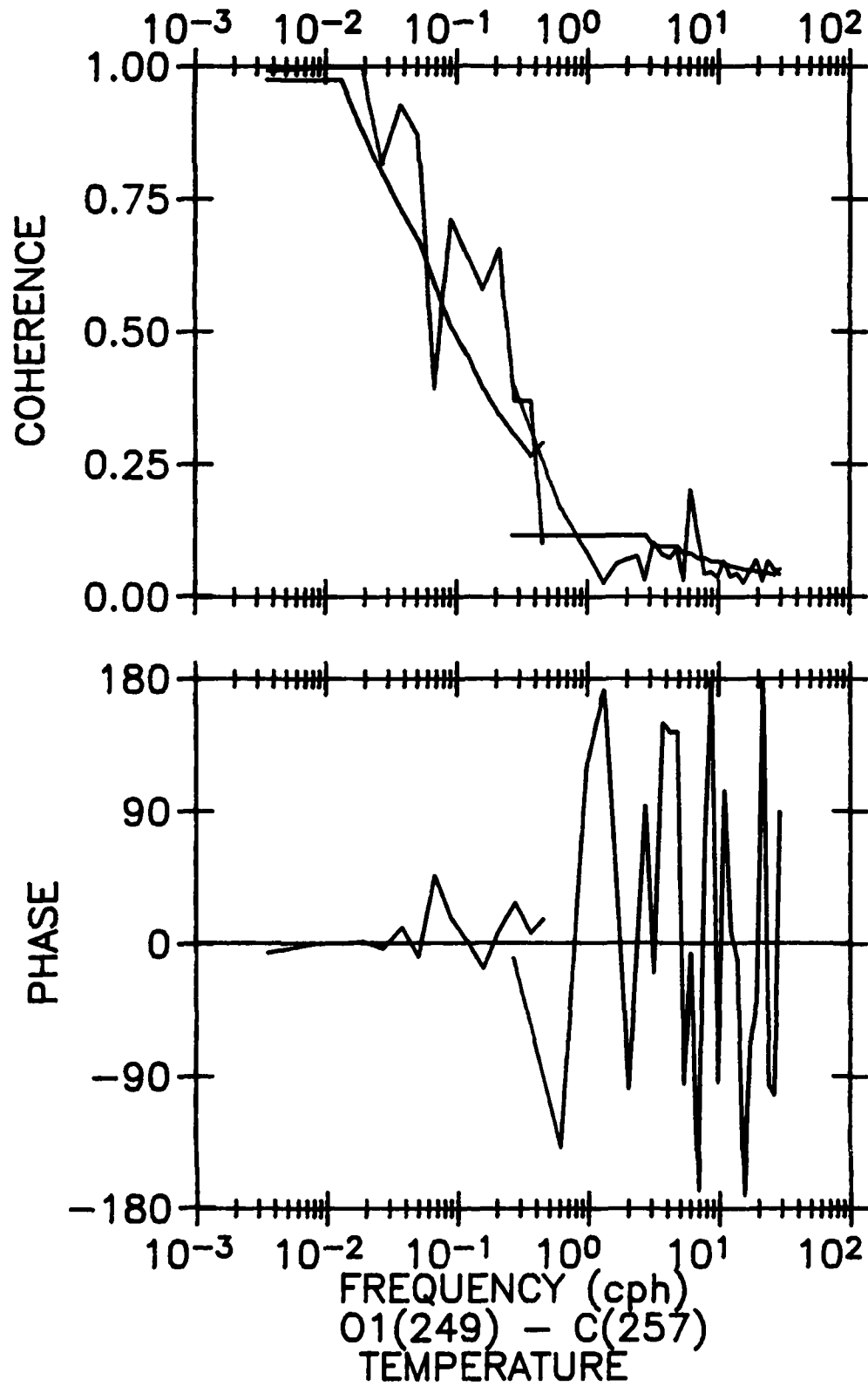


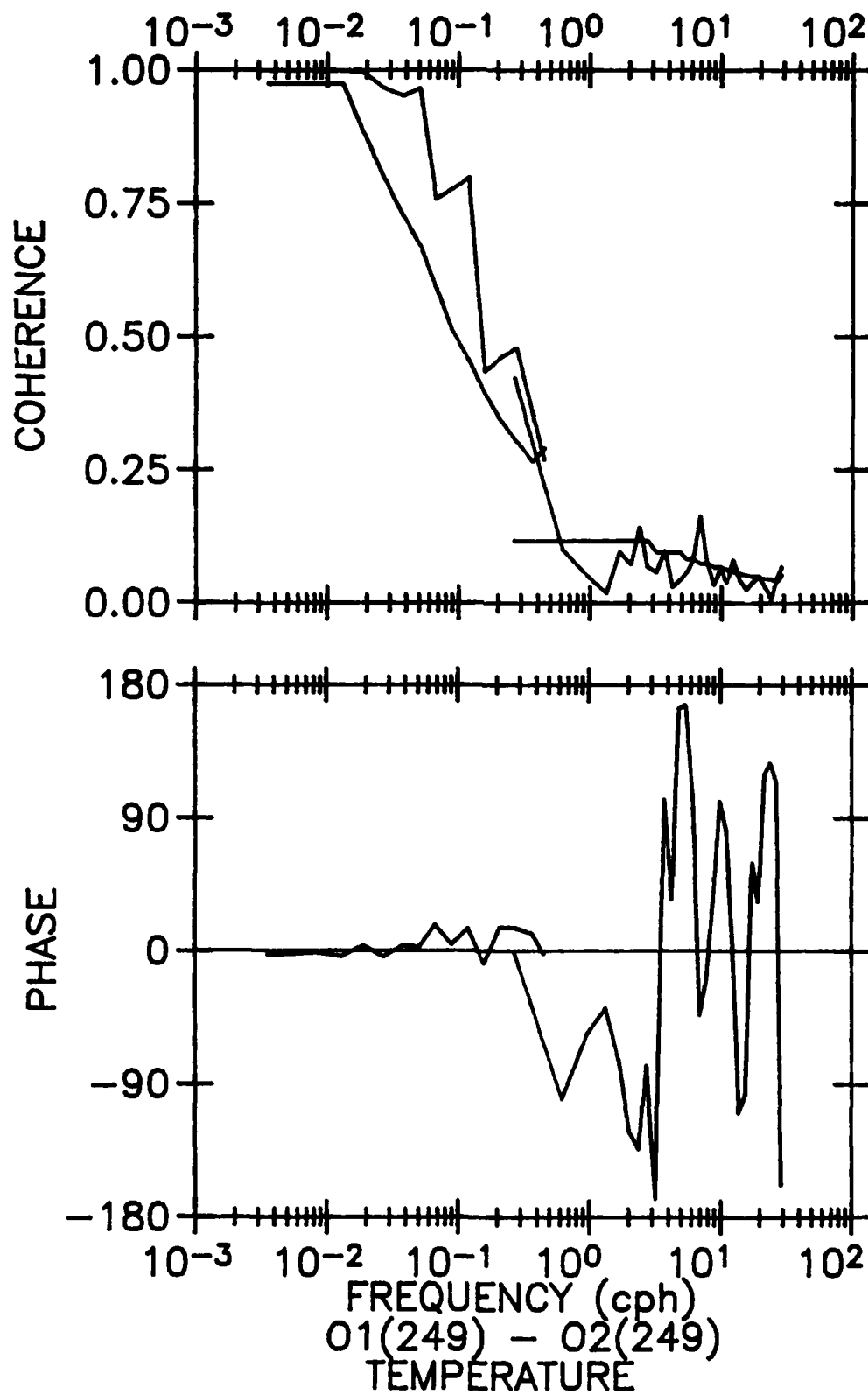


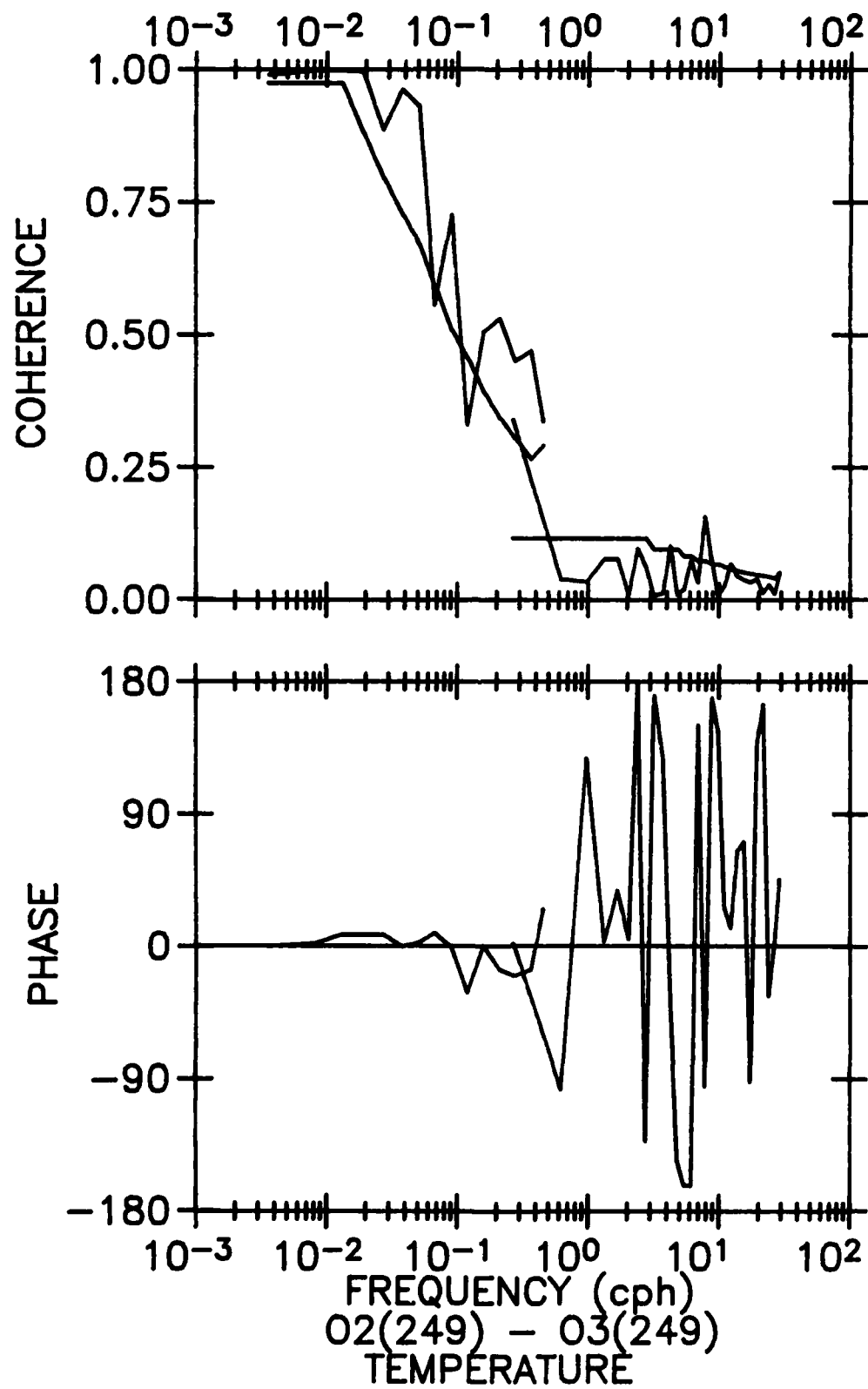


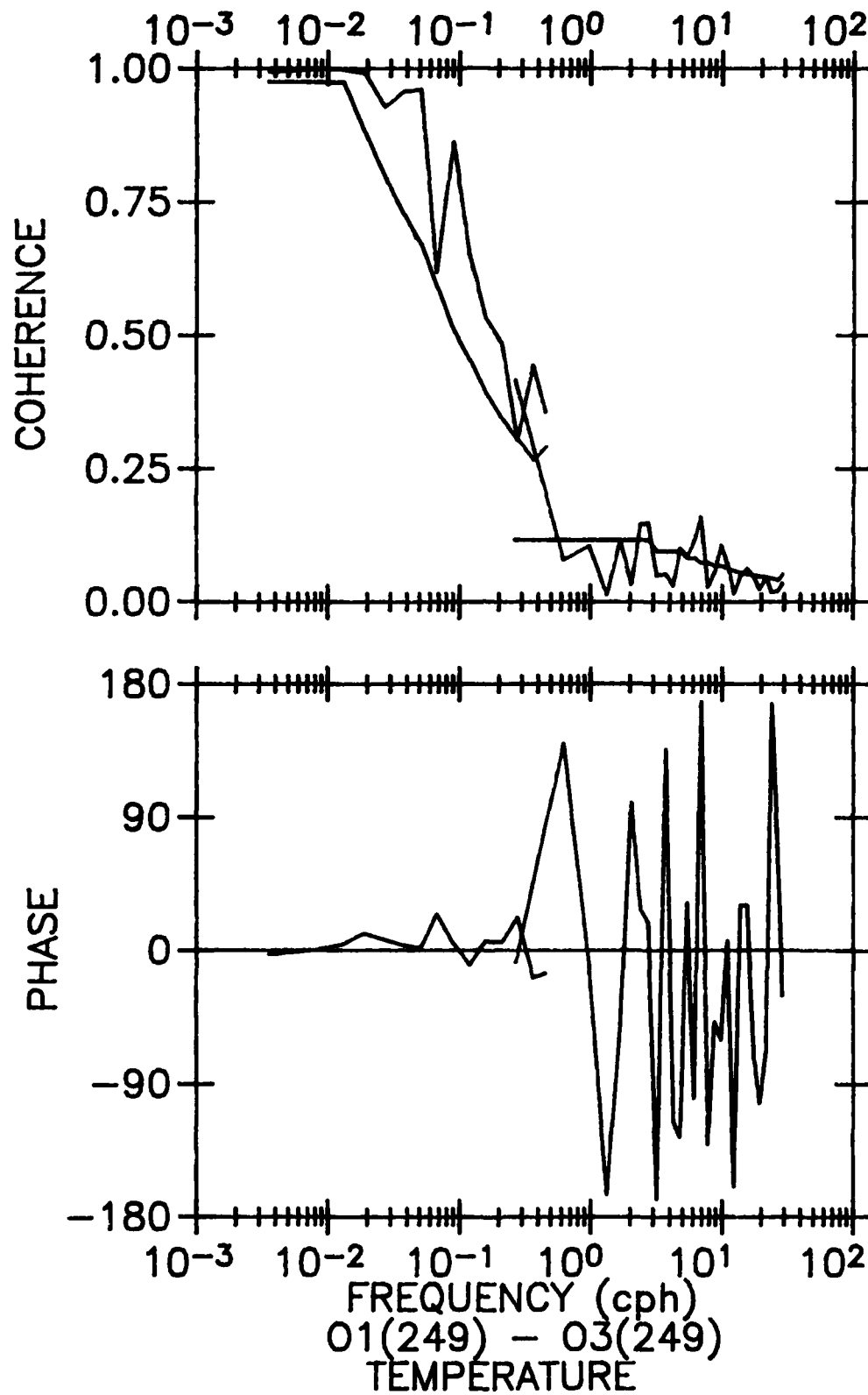
## HORIZONTAL COHERENCES

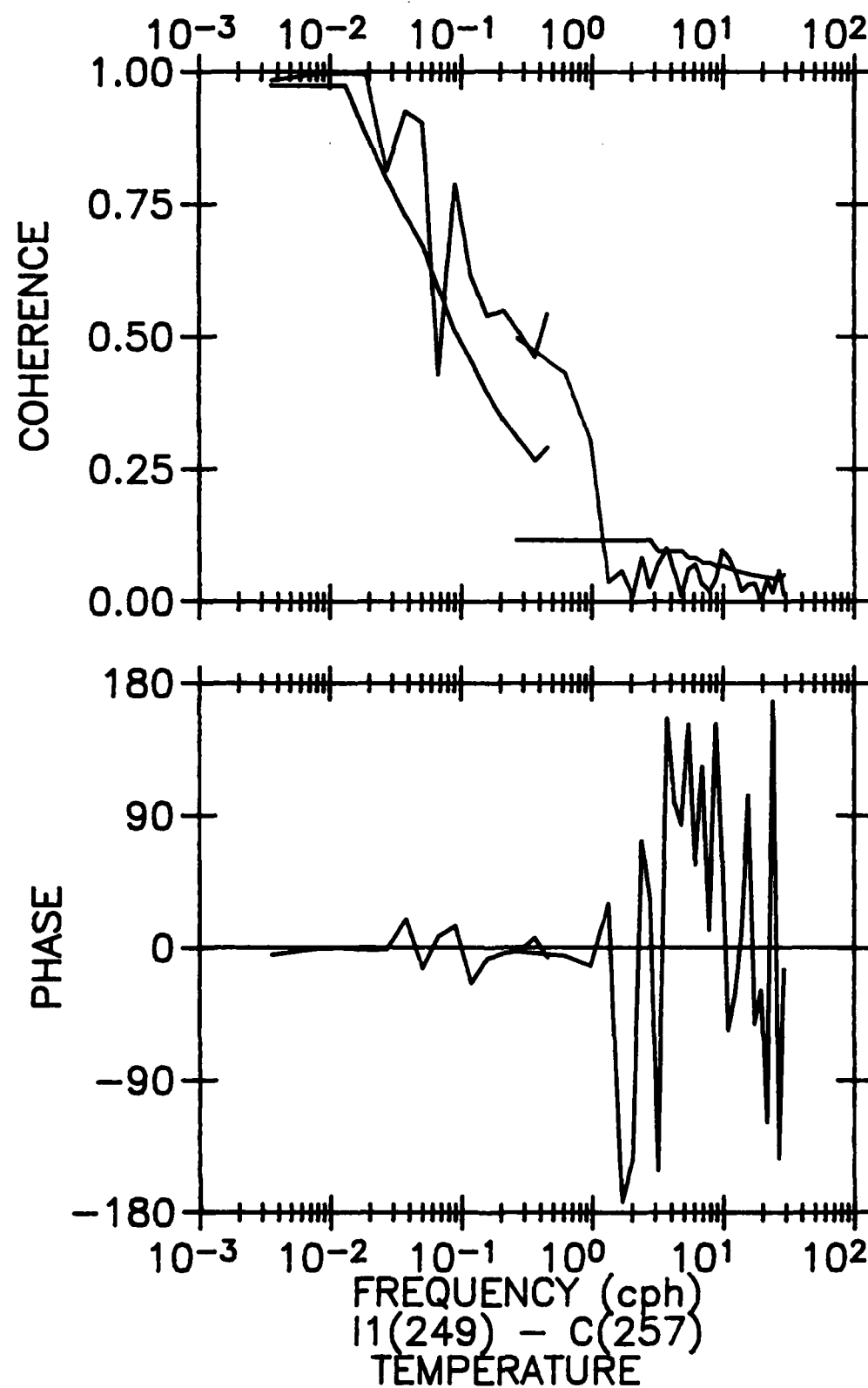
Selected coherences between horizontally separated temperature observations.

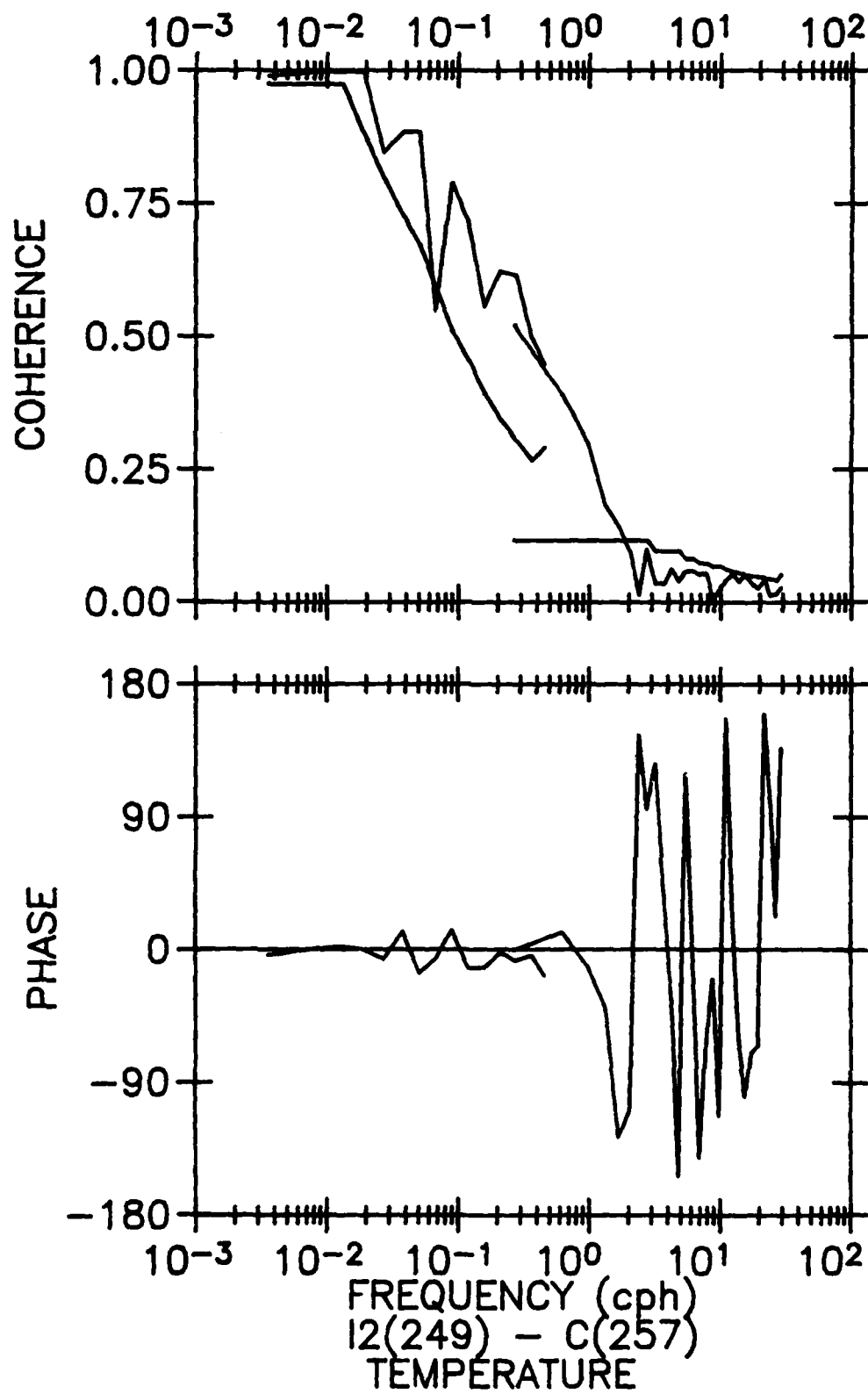


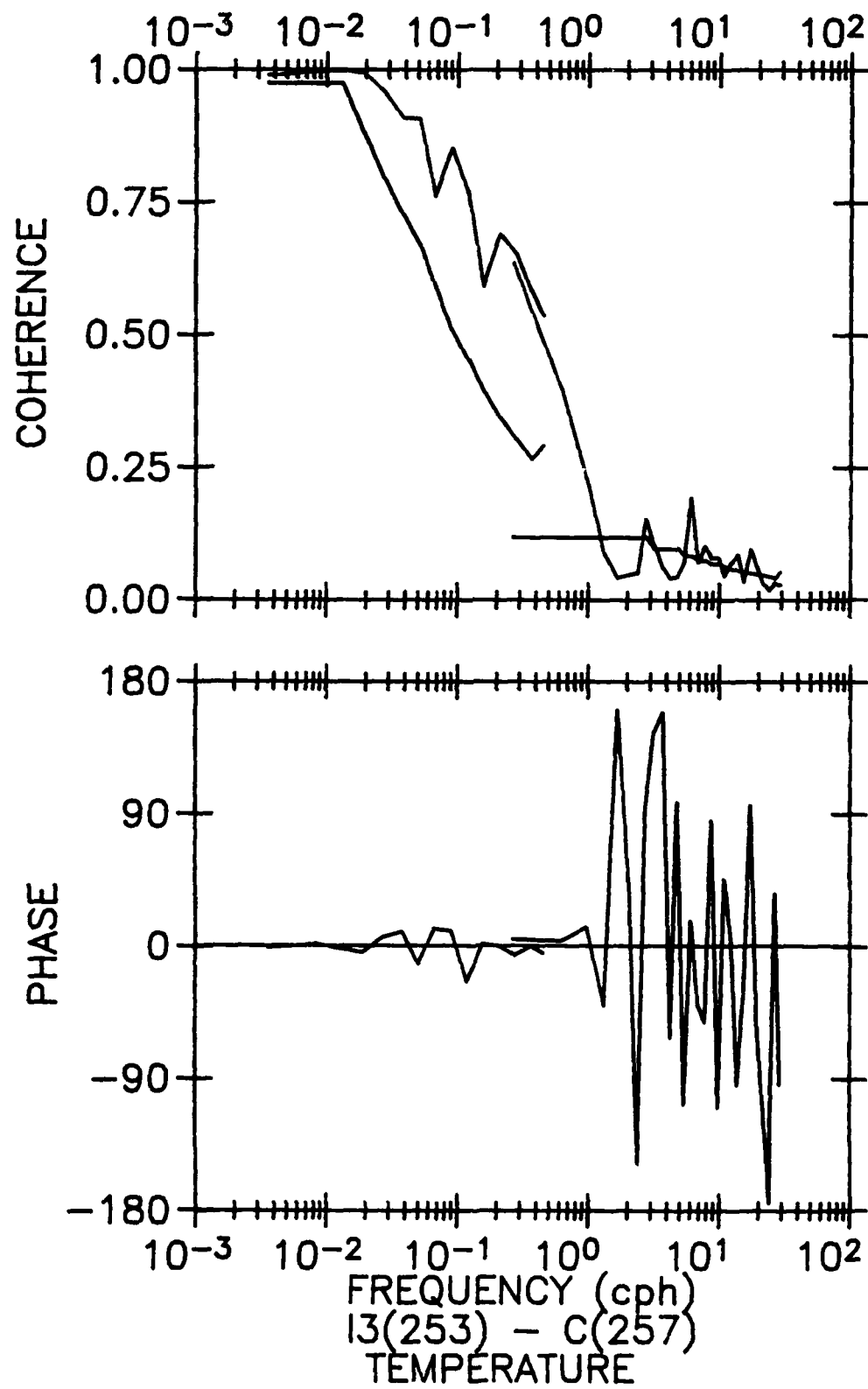














AD-A171 045

MOORED TEMPERATURE AND CONDUCTIVITY OBSERVATIONS DURING  
AINEX (ARCTIC INT. (U) OREGON STATE UNIV CORVALLIS COLL  
OF OCEANOGRAPHY M D LEVINE ET AL. JUN 86 DATA-123

3/3

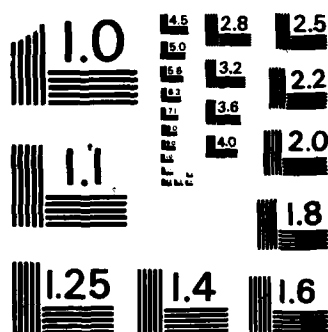
UNCLASSIFIED

N00014-84-C-0218

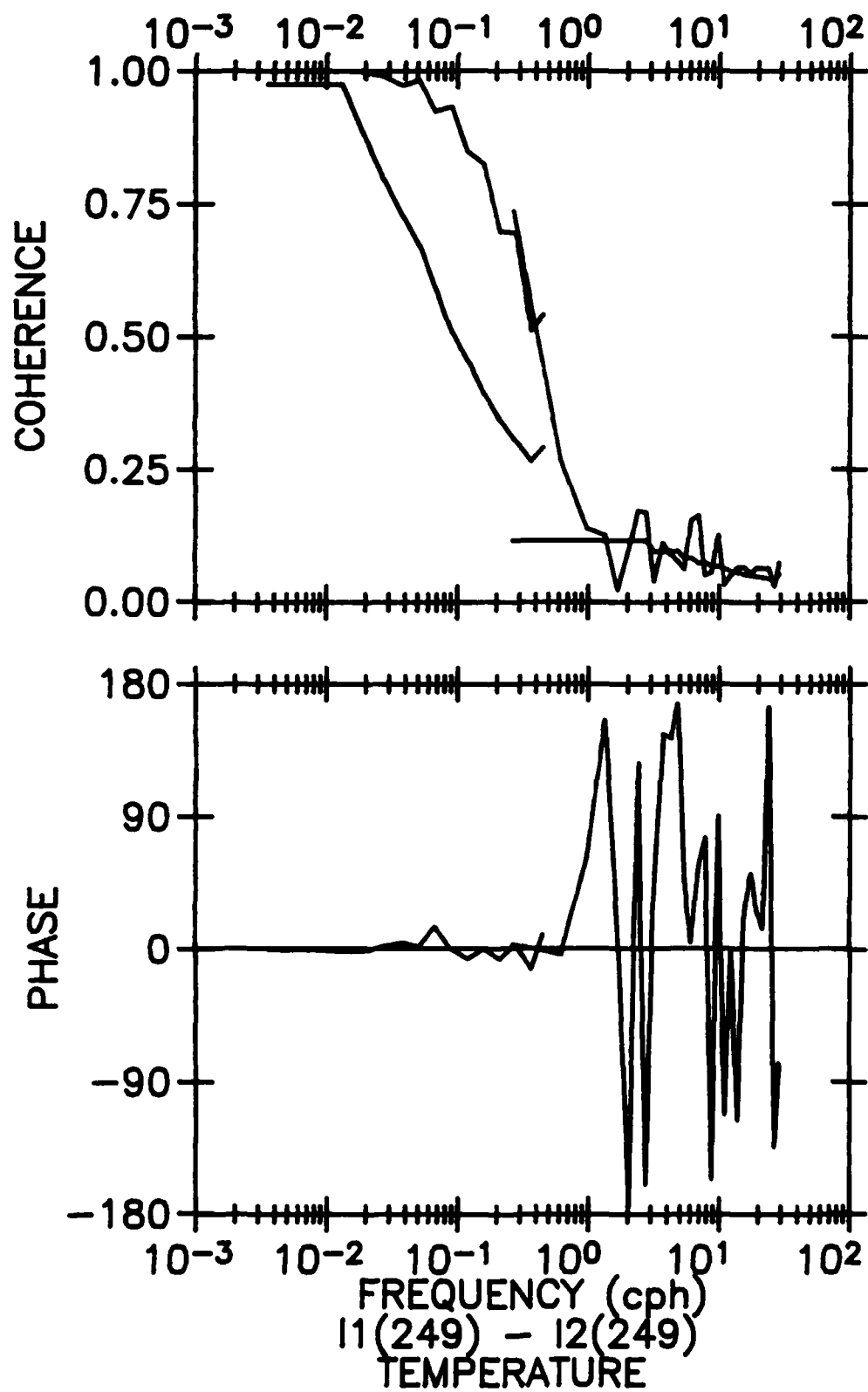
F/G 8/10

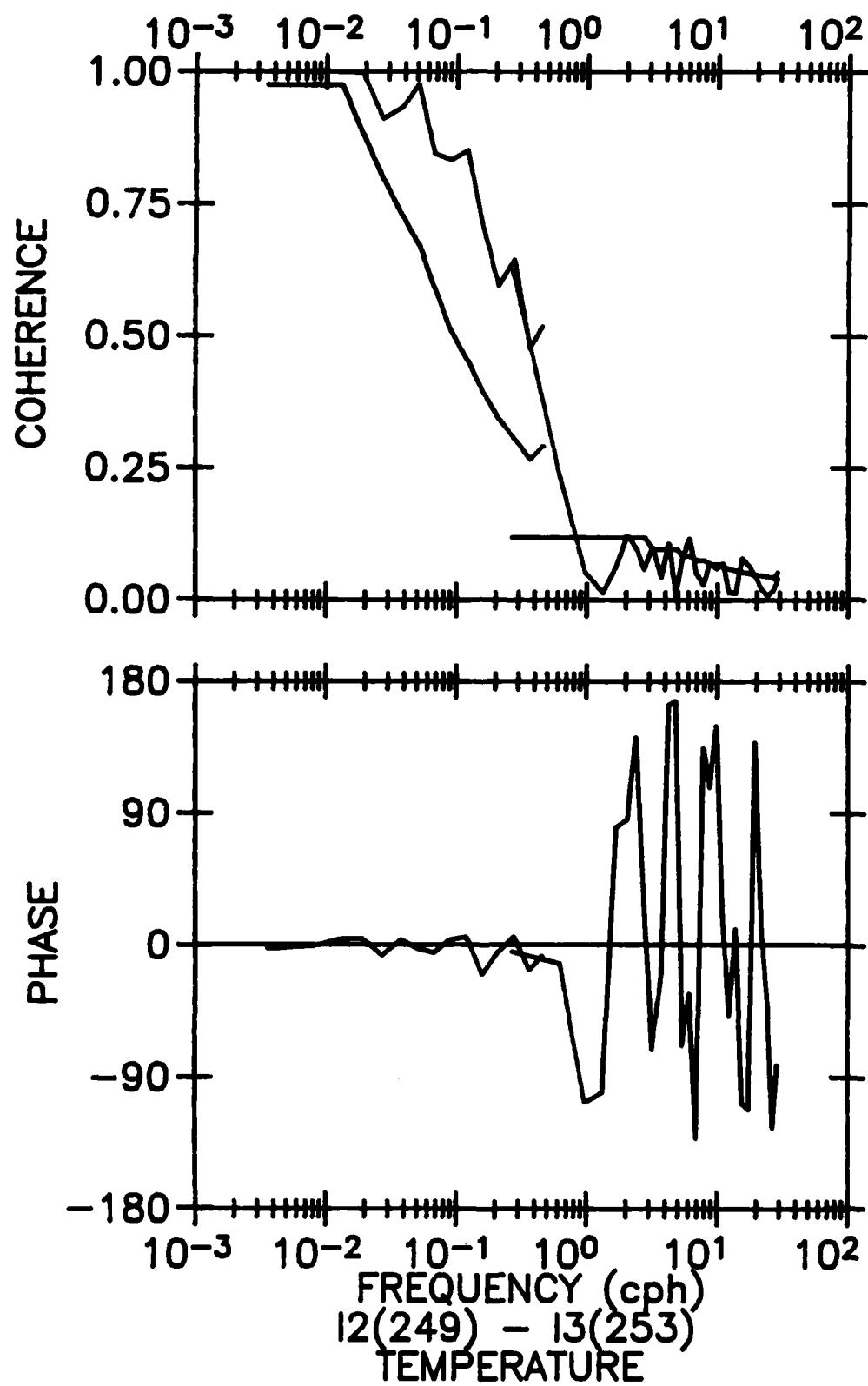
NL

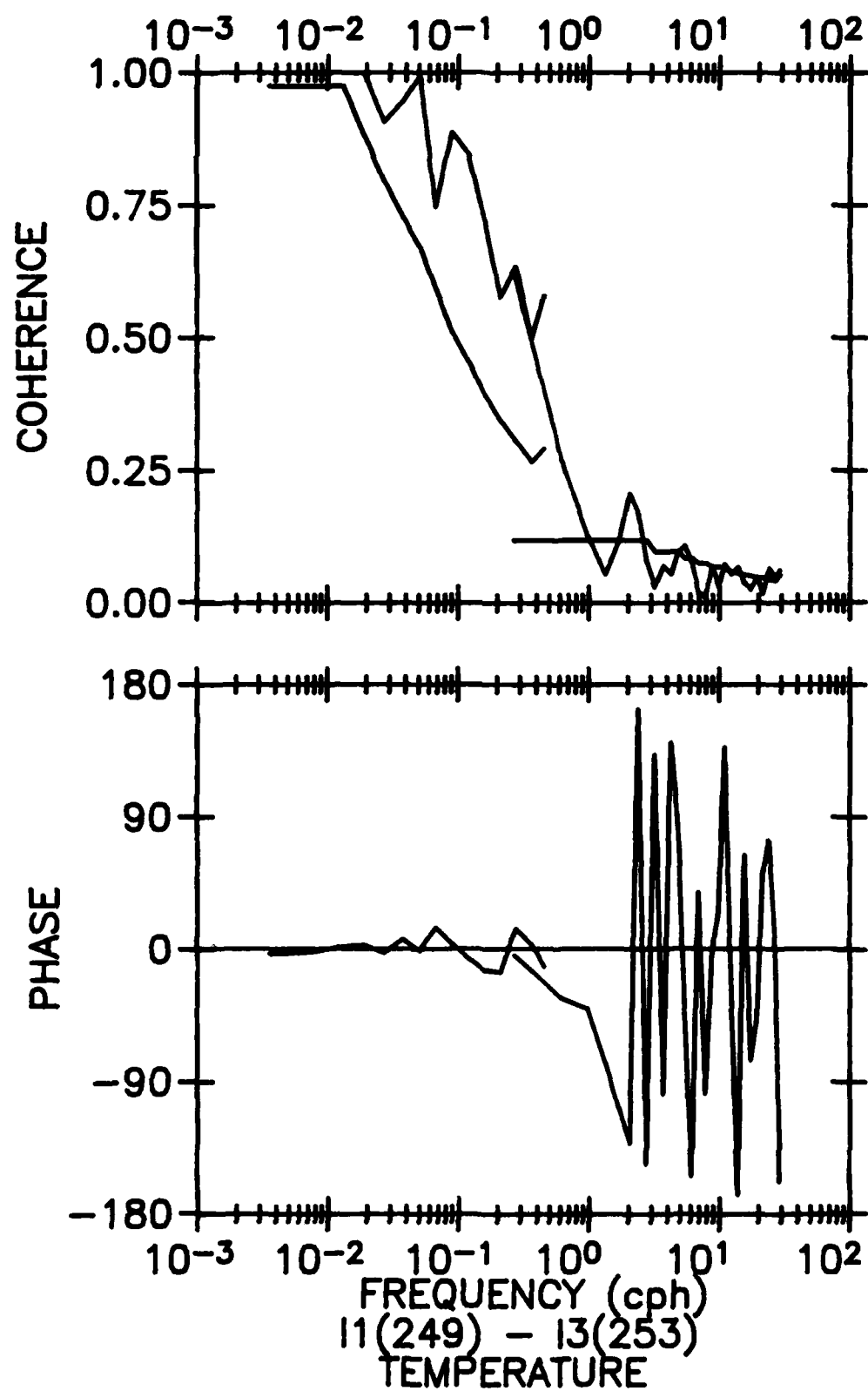




MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A







END

DTIC

9-86